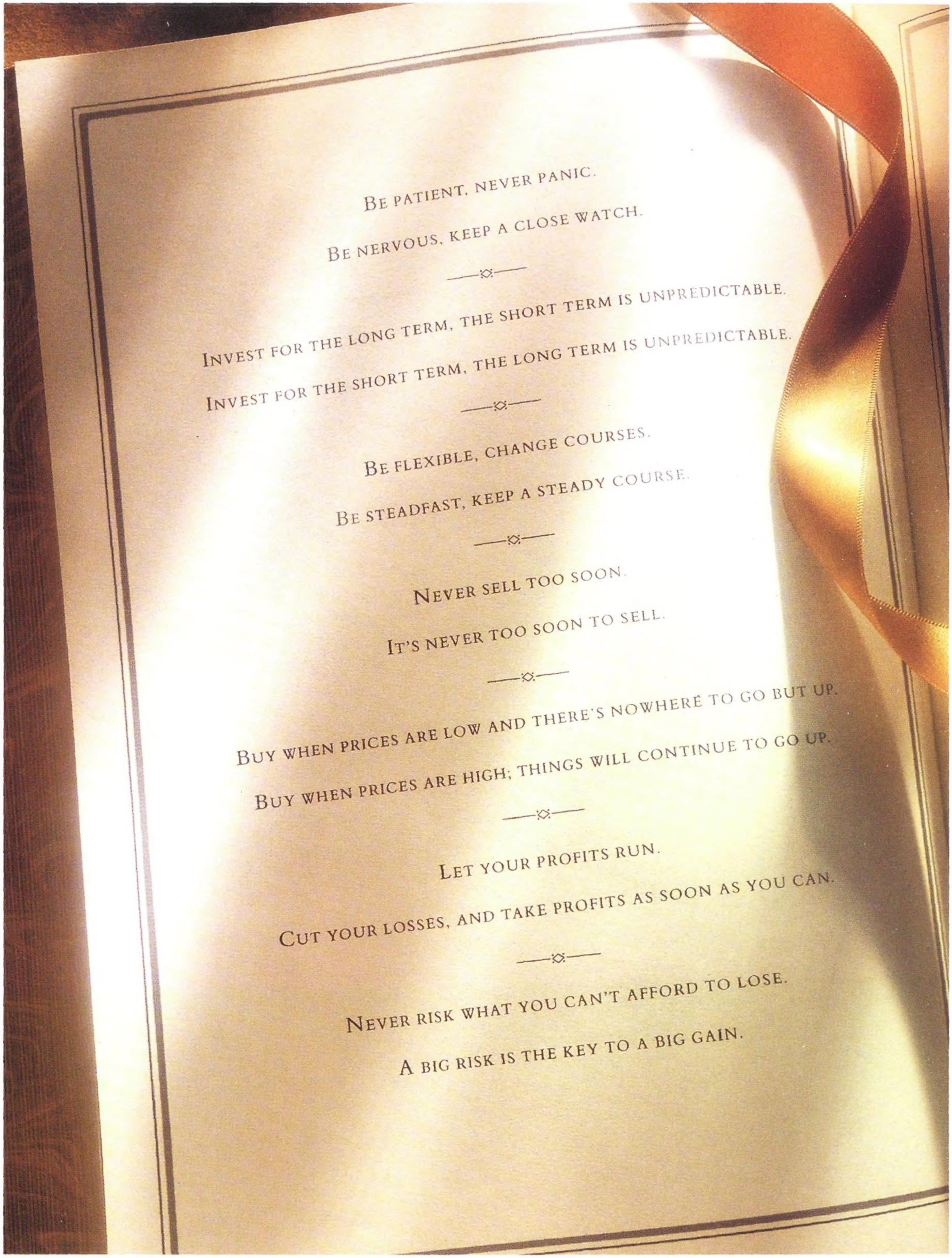
Smithsonian

June 1991

This sea of rose petals is the fragrant base for a soupçon of perfume (p. 52).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Be nervous, keep a close watch.
Invest for the long term, the short term is unpredictable.
Invest for the short term, the long term is unpredictable.
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Never sell too soon.
It's never too soon to sell.
Buy when prices are low and there's nowhere to go but up.
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A survey of industry professionals and their opinions compiled by John Rothchild in his book, A Fool And His Money.

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June 1991

Smithsonian

Volume 22, Number 3

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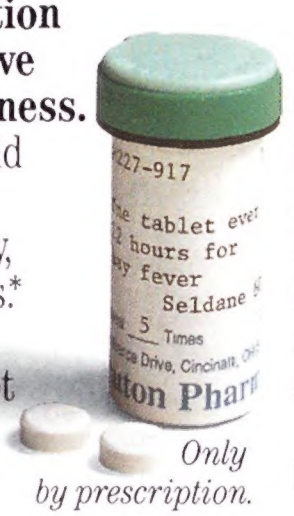

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*Definition of "risk of drowsiness" is incidence greater than placebo (a sugar pill).
†The reported incidence of drowsiness with Seldane (5.8%) in clinical studies involving more than 11,000 patients did not differ significantly from that reported in patients receiving placebo (6.9%).
‡Based upon worldwide prescription and distribution information (1986-1990)–data on file, Marion Merrell Dow Inc.
SEE BRIEF SUMMARY OF PRESCRIBING INFORMATION ON NEXT PAGE.

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Seldane®

(terfenadine) 60 mg Tablets

BRIEF SUMMARY

CAUTION: Federal law prohibits dispensing without prescription.

DESCRIPTION

Seldane (terfenadine) is available as tablets for oral administration. Each tablet contains 60 mg terfenadine. Tablets also contain, as inactive ingredients, corn starch, gelatin, lactose, magnesium stearate, and sodium bicarbonate.

INDICATIONS AND USAGE

Seldane is indicated for the relief of symptoms associated with seasonal allergic rhinitis such as sneezing, rhinorrhea, pruritus, and lacrimation.

CONTRAINDICATIONS

Seldane is contraindicated in patients with a known hypersensitivity to terfenadine or any of its ingredients.

PRECAUTIONS

General: Terfenadine undergoes extensive metabolism in the liver. Patients with impaired hepatic function (alcoholic cirrhosis, hepatitis), or on ketoconazole or troleandomycin therapy, or having conditions leading to QT prolongation (e.g. hypokalemia, congenital QT syndrome) may experience QT prolongation and/or ventricular tachycardia at the recommended dose. The effect of terfenadine in patients who are receiving agents which alter the QT interval is not known. These events have also occurred in patients on macrolide antibiotics, including erythromycin, but causality is unclear. The events may be related to altered metabolism of the drug, to electrolyte imbalance, or both.

Information for patients: Patients taking Seldane should receive the following information and instructions. Antihistamines are prescribed to reduce allergic symptoms. Patients should be questioned about pregnancy or lactation before starting Seldane therapy, since the drug should be used in pregnancy or lactation only if the potential benefit justifies the potential risk to fetus or baby. Patients should be instructed to take Seldane only as needed and not to exceed the prescribed dose. Patients should also be instructed to store this medication in a tightly closed container in a cool, dry place, away from heat or direct sunlight, and away from children.

Drug Interactions: Preliminary evidence exists that concurrent ketoconazole or macrolide administration significantly alters the metabolism of terfenadine. Concurrent use of Seldane with ketoconazole or troleandomycin is not recommended. Concurrent use of other macrolides should be approached with caution.

Carcinogenesis, mutagenesis, impairment of fertility: Oral doses of terfenadine, corresponding to 63 times the recommended human daily dose, in mice for 18 months or in rats for 24 months, revealed no evidence of tumorigenicity. Microbial and micronucleus test assays with terfenadine have revealed no evidence of mutagenesis.

Reproduction and fertility studies in rats showed no effects on male or female fertility at oral doses of up to 21 times the human daily dose. At 63 times the human daily dose there was a small but significant reduction in implants and at 125 times the human daily dose reduced implants and increased postimplantation losses were observed, which were judged to be secondary to maternal toxicity.

Pregnancy Category C: There was no evidence of animal teratogenicity. Reproduction studies have been performed in rats at doses 63 times and 125 times the human daily dose and have revealed decreased pup weight gain and survival when terfenadine was administered throughout pregnancy and lactation. There are no adequate and well-controlled studies in pregnant women. Seldane should be used during pregnancy only if the potential benefit justifies the potential risk to the fetus.

Nonteratogenic effects: Seldane is not recommended for nursing women. The drug has caused decreased pup weight gain and survival in rats given doses 63 times and 125 times the human daily dose throughout pregnancy and lactation. Effects on pups exposed to Seldane only during lactation are not known, and there are no adequate and well-controlled studies in women during lactation.

Pediatric use: Safety and effectiveness of Seldane in children below the age of 12 years have not been established.

ADVERSE REACTIONS

Experience from clinical studies, including both controlled and uncontrolled studies involving more than 2,400 patients who received Seldane, provides information on adverse experience incidence for periods of a few days up to six months. The usual dose in these studies was 60 mg twice daily, but in a small number of patients, the dose was as low as 20 mg twice a day, or as high as 600 mg daily.

In controlled clinical studies using the recommended dose of 60 mg b.i.d., the incidence of reported adverse effects in patients receiving Seldane was similar to that reported in patients receiving placebo. (See Table below)

ADVERSE EVENTS REPORTED IN CLINICAL TRIALS

Adverse Event	Percent of Patients Reporting				
	Controlled Studies*			All Clinical Studies**	
	Seldane N=781	Placebo N=665	Control N=626***	Seldane N=2462	Placebo N=1478
Central Nervous System					
Drowsiness	9.0	8.1	18.1	8.5	8.2
Headache	6.3	7.4	3.8	15.8	11.2
Fatigue	2.9	0.9	5.8	4.5	3.0
Dizziness	1.4	1.1	1.0	1.5	1.2
Nervousness	0.9	0.2	0.6	1.7	1.0
Weakness	0.9	0.6	0.2	0.6	0.5
Appetite Increase	0.6	0.0	0.0	0.5	0.0
Gastrointestinal System					
Gastrointestinal Distress (Abdominal distress, Nausea, Vomiting, Change in Bowel habits)	4.6	3.0	2.7	7.6	5.4
Eye, Ear, Nose, and Throat					
Dry Mouth/Nose/Throat	2.3	1.8	3.5	4.8	3.1
Cough	0.9	0.2	0.5	2.5	1.7
Sore Throat	0.5	0.3	0.5	3.2	1.6
Epistaxis	0.0	0.8	0.2	0.7	0.4
Skin					
Eruption (including rash and urticaria) or itching	1.0	1.7	1.4	1.6	2.0

*Duration of treatment in "CONTROLLED STUDIES" was usually 7-14 DAYS.
**Duration of treatment in "ALL CLINICAL STUDIES" was up to 6 months.
***CONTROL DRUGS: Chlorpheniramine (291 patients), d-Chlorpheniramine (189 patients), Clemastine (146 patients).

Rare reports of severe cardiovascular adverse effects have been received which include arrhythmias (ventricular tachyarrhythmia, torsades de pointes, ventricular fibrillation), hypotension, palpitations, and syncope. In controlled clinical trials in otherwise normal patients with rhinitis, at doses of 60 mg b.i.d. small increases in QTc interval were observed. Changes of this magnitude in a normal population are of doubtful clinical significance. However, in another study (N=20 patients) at 300 mg b.i.d. a mean increase in QTc of 10% (range −4% to +30%) (mean increase of 46 msec) was observed without clinical signs or symptoms.

In addition to the more frequent side effects reported in clinical trials (See Table), adverse effects have been reported at a lower incidence in clinical trials and/or spontaneously during marketing of Seldane that warrant listing as possibly associated with drug administration. These include: alopecia (hair loss or thinning), anaphylaxis, angioedema, bronchospasm, confusion, depression, galactorrhea, insomnia, menstrual disorders (including dysmenorrhea), musculoskeletal symptoms, nightmares, paresthesia, photosensitivity, seizures, sinus tachycardia, sweating, tremor, urinary frequency, and visual disturbance.

In clinical trials, several instances of mild, or in one case, moderate transaminase elevations were seen in patients receiving Seldane. Mild elevations were also seen in placebo treated patients. Marketing experiences include isolated reports of jaundice, cholestatic hepatitis, and hepatitis. In most cases available information is incomplete.

OVERDOSAGE

Information concerning possible overdosage and its treatment appears in Full Prescribing Information.

DOSAGE AND ADMINISTRATION

One tablet (60 mg) twice daily for adults and children 12 years and older.

Product Information as of July, 1990

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Prescription Products Division
Kansas City, MO 64114

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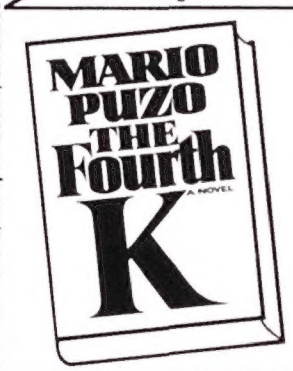

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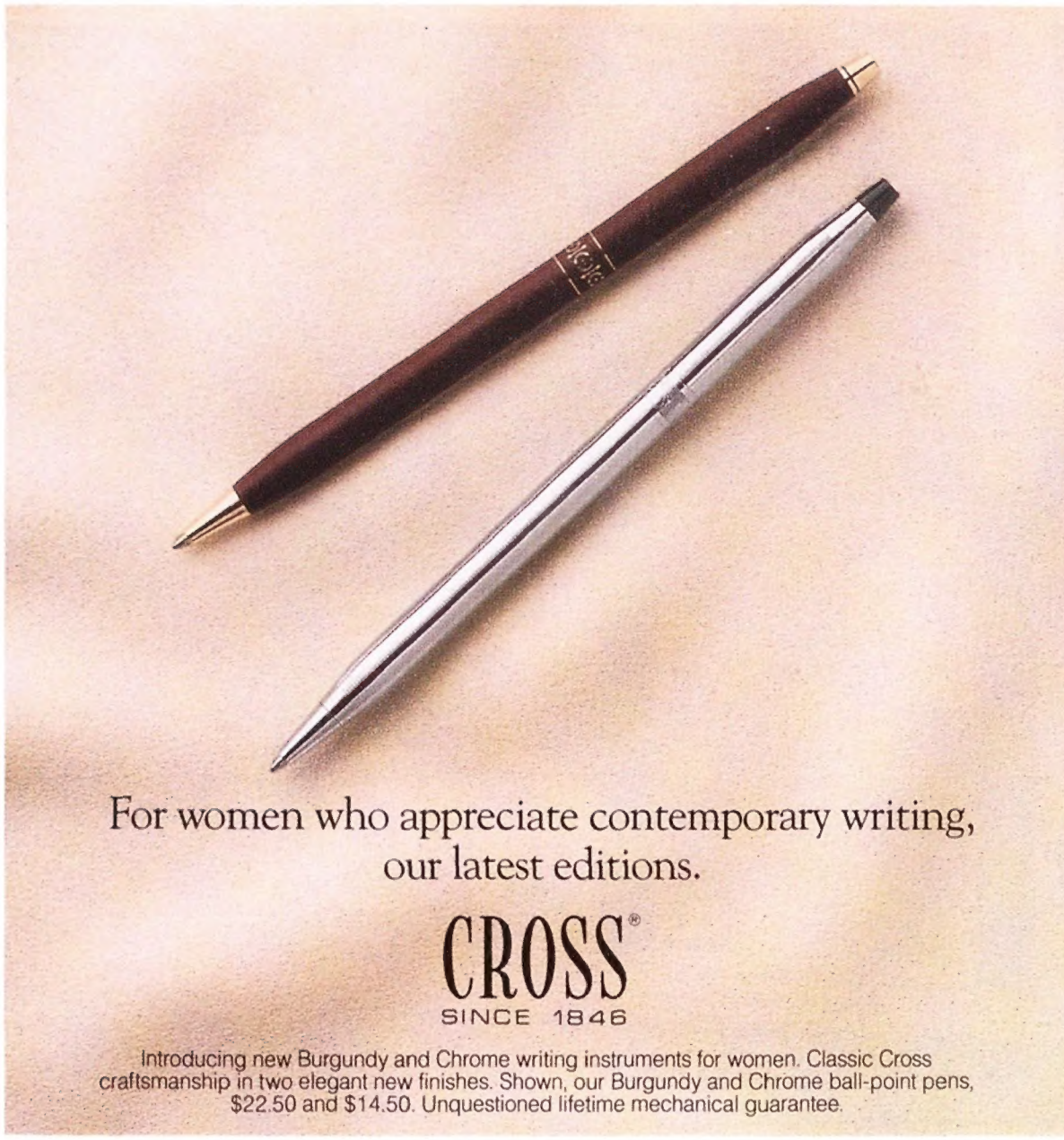
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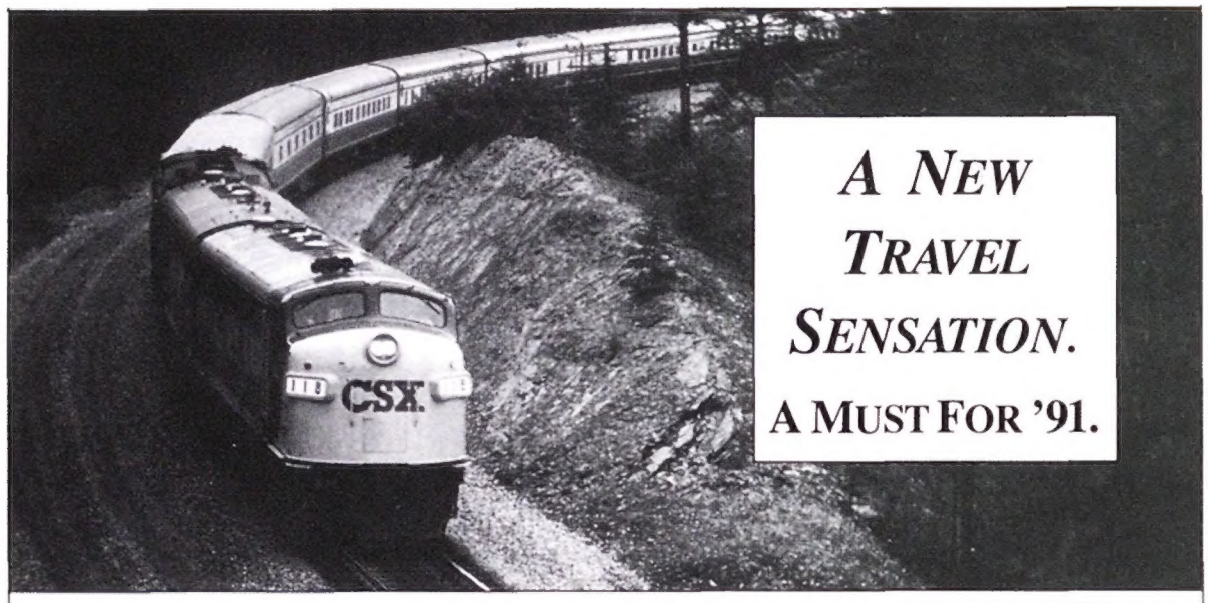

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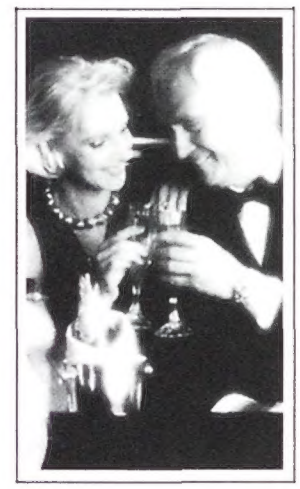

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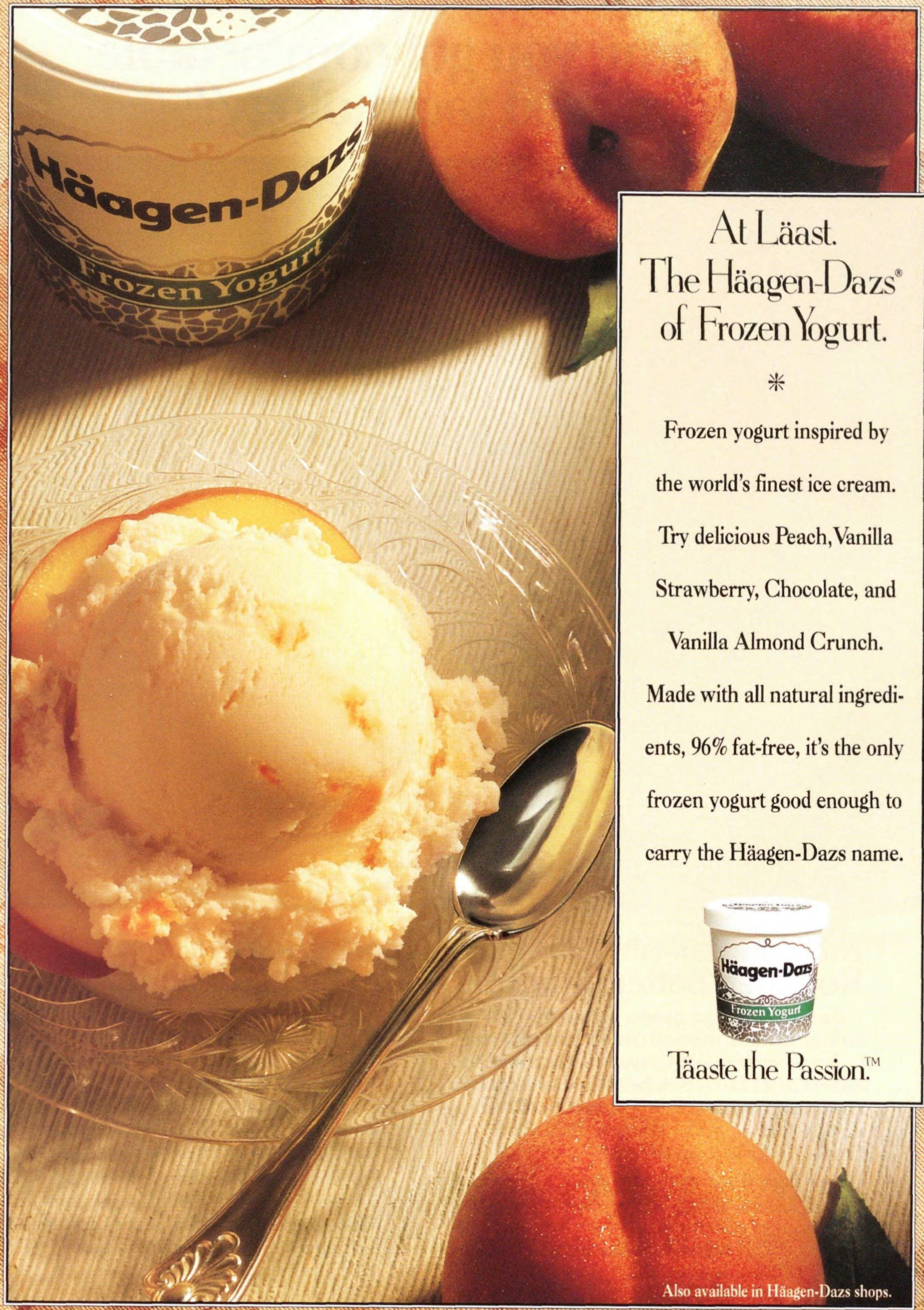

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Secretary Adams' comments

Smithsonian horizons

Recent acquisitions by one of our own museums prompt reconsideration of the place to be accorded to folk arts

American folk arts are enormously variegated, sturdy flowers. Likening them to weeds, and museums to gardens, some would assert that they belong only where they have always primarily flourished, on the neglected, uncultivated margins of collections as well as exhibitions. Yet they have patrons and protagonists as well as skeptics and detractors, and if the former are right, their day in the full sun of recognition may be here.

Herbert Waide Hemphill jr. is such a patron, and with the acquisition of 427 objects from his collection (partly as a gift and partly by purchase) the National Museum of American Art has thrown open the door to serious reconsideration of the place that should be accorded to this work—if not in canonical Art, then at least somewhere significant in the more expansive, less defensively circumscribed realm of popular culture. Museum director Elizabeth Broun, having recently devoted a major exhibition to the collection, surely qualifies as a strong, strategically placed protagonist. (The catalog, *Made with Passion: The Hemphill Folk Art Collection in the National Museum of American Art*, is by the exhibition's organizer, associate curator Lynda Roscoe Hartigan.)

No unillustrated column of print can convey the cornucopia of inventiveness to be found in the Hemphill Collection (one may, however, turn to *Highlights continued* in the October 1990 SMITHSONIAN). In the words of one reviewer, it is a "cacophonous, pulsating melange of form, material and artistic expression . . . in every possible medium and at every level of refinement." Implicit in this is a relative indifference to (or ignorance of) fine art's tradition, helping to account for folk art's reputation for originality and easy accessibility. Hence for Broun the challenge is not to force it "into a canon of art based on established formalist precepts, but to open our eyes and minds to all that [it says] about our lives and experience." Therein, however, lies a basis for skepticism as well as warm acceptance.

Critics have pointed out that amplitude of vision may not be an adequate substitute for absence of concern with hierarchies of quality. In the words of one of them, "This, after all, is what museums are for." But to Broun that definitional function is not necessarily the most important. "Art is less a category than an honorific. Often this sign of esteem is cast like a veil . . . substituting a vague transcendent idea that says less about the work than the speaker."

So a real issue is joined here, based on alternative visions of museums. One vision fairly uniformly applies and defends existing critical standards. The other, while not excluding that objective, also seeks to encourage the widest possible experimentation with artistic expression by successively wider circles of the public. With this difference in mind, I have been intrigued to examine many hundreds of comments written by visitors after they viewed the exhibition of the Hemphill Collection last winter:

"Shows that there is untapped talent out there and everywhere."

"A warm exhilarating show in the midst of chaos, war and self-examination."

"Margaret (age 5) thinks she wants to make things like these."

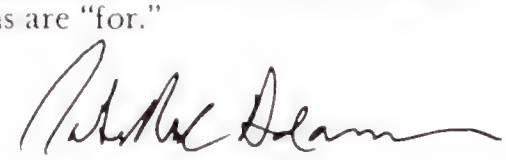
"Real art here—art for survival, celebration, for release of demons, for prophecy, for sanity. The work of real people goes on and on—underground—at heart level."

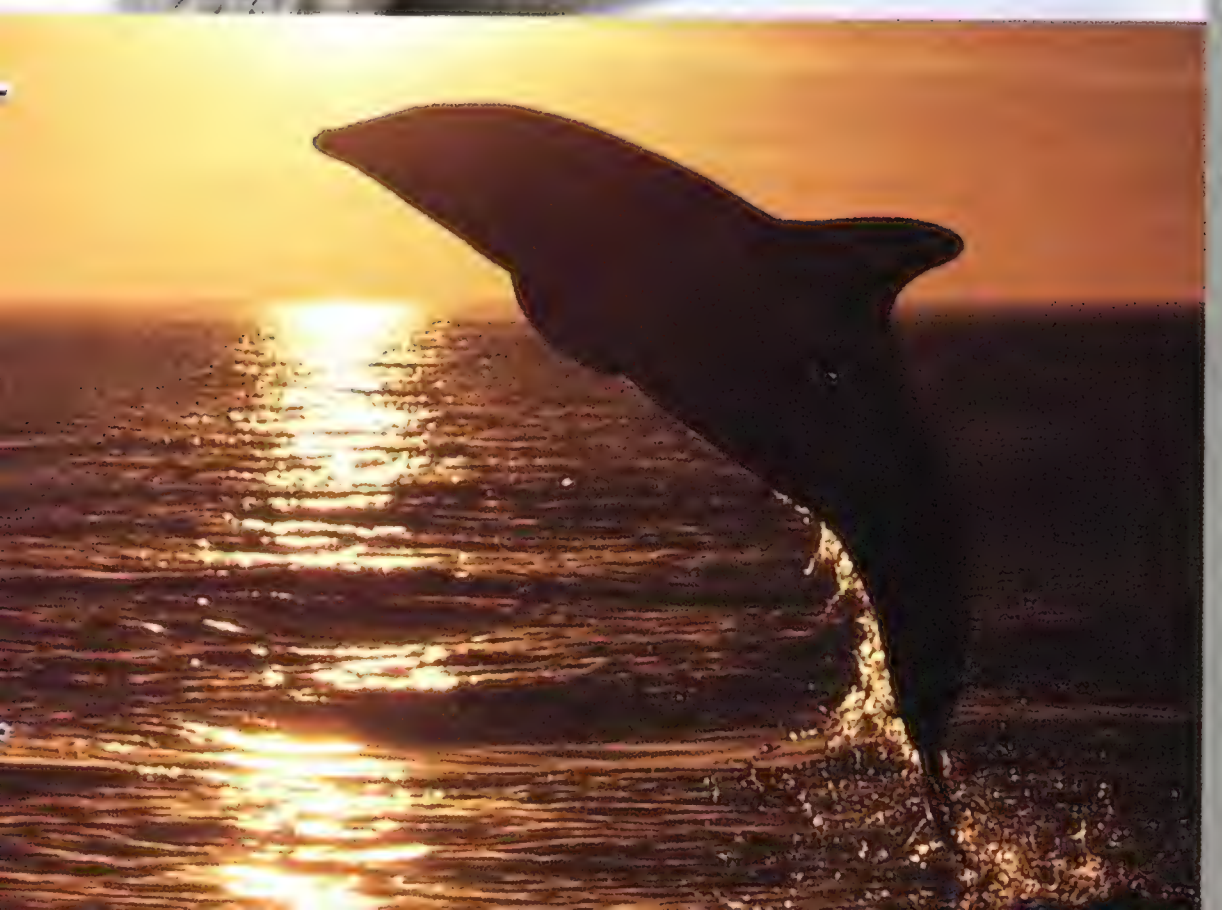
"These works inspire the artist in me. I think I'll get busy."

"I thought it was onederful! age: 6."

Admittedly, none of these comments (representative of the vast majority) respond to the critics on their own chosen ground. It is hard to deny, for example, that some of the collection can be plausibly described as mere kitsch. But is this a real (if inherently subjective) boundary, or does the collection strive to make another point about the continuities between art and popular culture by serenely ignoring boundaries altogether? And to what extent is the vitality, perhaps even the survival, of folk art dependent on the retention of a significant degree of local and personal autonomy on the part of the artist? If so, how well, and for how long, are its most creative elements likely to withstand the imposition of uniform educational standards and the homogenizing force of the mass media? To some critics, time already ran out in this country some decades ago.

Yet did it? Public comments like those I have mentioned contain no hint of a slackening of the creative impulses that folk art was expected to evoke. Nor is such a slackening apparent in our annually celebrated Folklife Festival on the Mall. Folk art in general, I would judge, clearly retains its power to create new bonds of identification and affection between cultural institutions and the increasingly broad, nontraditional audiences they deserve—and have a responsibility to seek. I'm all for canons and standards, but this is also what museums are "for."





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p. 22: Enter
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Letters to the Editor

Mannequins

Dear Sir: Your April article brings to mind a long-ago story from a small town in Minnesota. A prominent citizen with something of a drinking problem fell asleep one night on a bench, where some prankish friends found him. You can imagine his surprise—and chagrin—when he awoke the next day to find himself being viewed as a mannequin by the crowd gathering outside the furniture-store window, wherein he lay neatly ensconced in fancy bedclothes on an elegant four-poster bed.

They say he never took another drink.

William D. Carlson
West Hartford, Connecticut

Dear Sir: I did my share of mannequins as exhibits director for Plimoth Plantation, with its replica Pilgrim Village and the *Mayflower II*, in and on which I placed 75 Pilgrims in a variety of poses. A small boy fainted when he saw "Dr. Fuller" lancing a boil on a Pilgrim's leg. Touring the *Mayflower II*, a boy and girl studied a sailor asleep in a hammock, then excitedly told their mother he was moving—and snoring. He was, thanks to two hidden members of the crew.

Cyril Leek Marshall
Plymouth, Massachusetts

Dear Sir: In a recent issue of the *Chattanooga News-Free Press*, John Shearer reported on a phenomenon visible to travelers on the Tennessee River in Marion County.

A sultry, stylish blonde appears to wave at passing boaters from Harold and Jackie Loyd's backyard. Many have waved back enthusiastically before dis-

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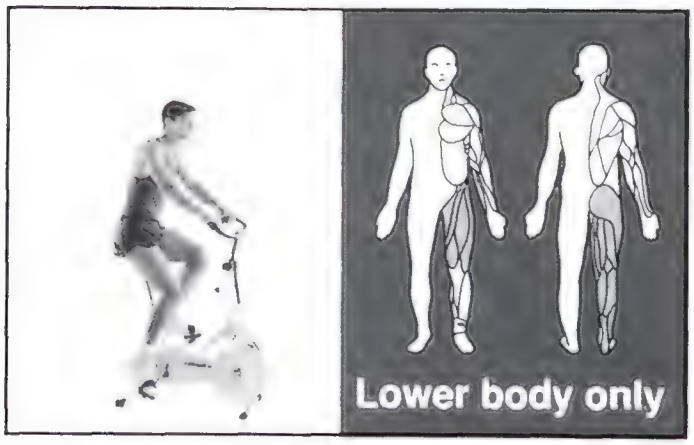

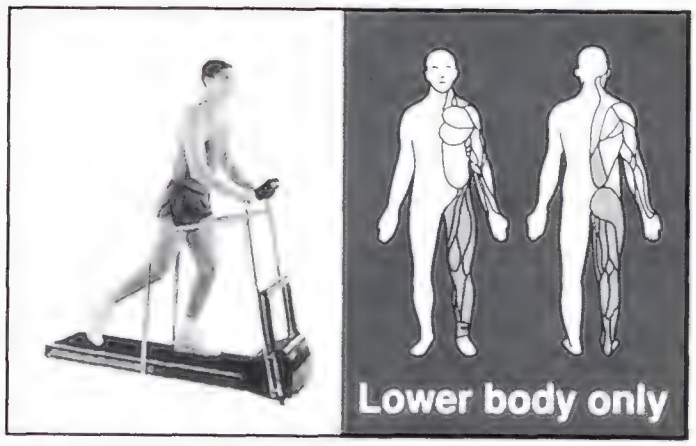

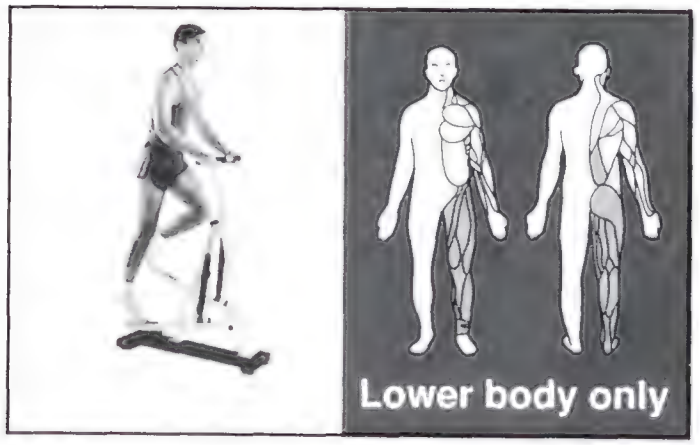

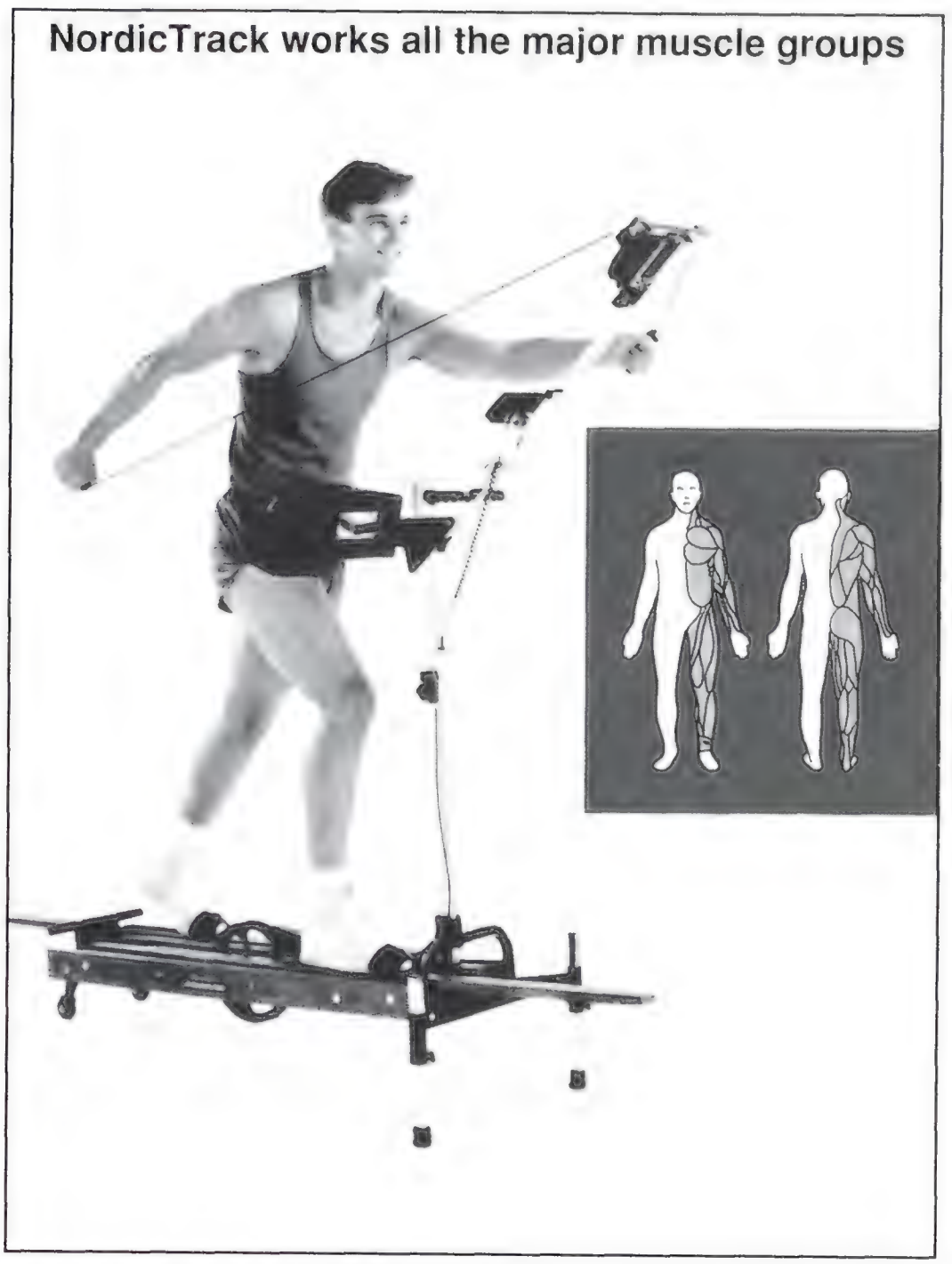

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p. 10: Don't just visit

an 18th century tavern. Eat there.

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covering that the "Lorelei" is but a mannequin. Mrs. Loyd, who acquired the figure when the video production firm where she worked went belly-up, makes sure the mannequin is appropriately dressed for the passing seasons: a wicked witch at Halloween, Mrs. Santa at Christmastime, wearer of a "Support Our Troops" sweatshirt during the Middle East war. But the biggest draw comes at bikini season.
Nancy C. McClure
Chattanooga

Dear Sir: The eerily realistic faces and figures in your story would have pleased the late John Collier. His story "Evening Primrose" deals with a collection of pallid folk who have taken up residence in a great department store. They escape detection by being largly nocturnal but often avoid notice by freezing in stylish attitudes like mannequins. Inevitably, love and death intrude.
Atwater James
Seattle

Egg collectors

Dear Sir: Your article evoked guilty memories of my boyhood venture into this hobby, over 60 years ago. I still recall shinnying up a tall tree to a flicker nest, reaching in and surprising an outraged bird on her eggs. One finger bore evidence of flicker nipping ability for some time.

My collecting days came to an abrupt end when a much-desired, almost-ready-to-hatch crow's egg resisted attempts to remove its contents. It was put in my collection as was. My mother soon sniffed an unpleasant odor and trashed my entire collection of 50 to 60 eggs. It was the last time I cried, as a lad.
Leo Weigant
Fenton, Michigan

Ferdinand Magellan

Dear Sir: Your article brought back memories of my mid-1960s visit to Mactan Island. Knowing ahead of time that it was the site of Magellan's death, I expected there would be something to memorialize this claim to fame, and sure enough there was, but not what I had anticipated. The first clue was that the island's village was named Lapu Lapu, in honor of the local chieftain who had led the warriors that day. And there in the center of the village, at the end of the ferry slip, was the memorial—

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p. 21: Where the daughter of

the stars meets the mother of presidents.

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a larger than life bronze statue of Lapu Lapu, holding on to a spear and looking ferocious but righteous, like an Old Testament Jehovah. There, also, was Magellan, lying on the ground, staring in horror at the spear, its business end buried deep in his chest.
James H. Hastings
Rapid City, South Dakota

Dear Sir: The title of Simon Winchester's article, "After dire straits . . . ," took me back to my first year at the Department of Geography, University of Kentucky, in 1955-56. My colleague Jim Shear, teaching the geography of Europe, gave a quiz on "important European locales and names," to be plotted on an outline map. Along with London, Paris, Rome and the English Channel, he included "Dire Straits." Many students set about busily trying to locate this particular place, all of them unaware that by seeking it they were *in* Dire Straits!
William A. Withington
Lexington, Kentucky

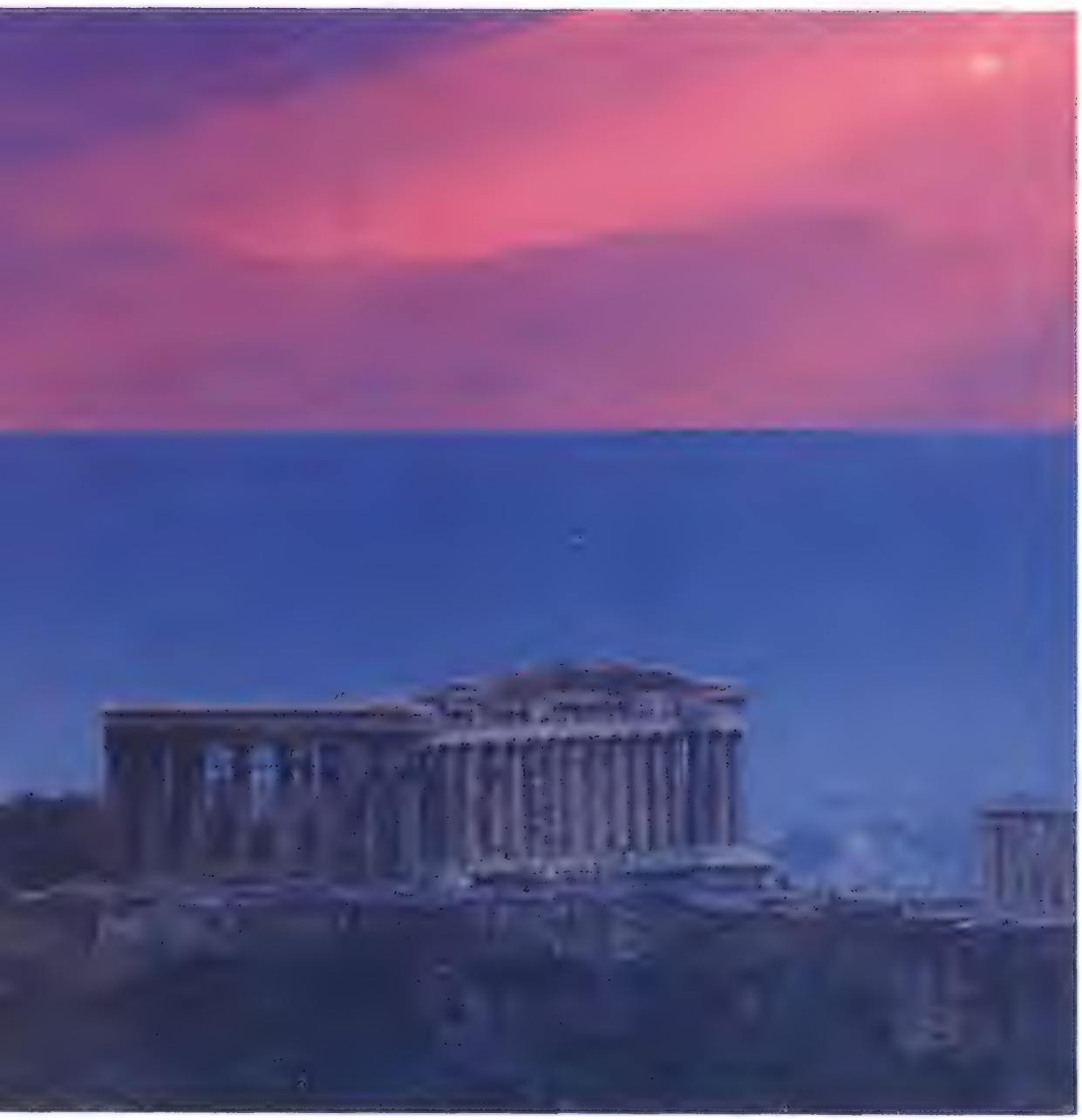
Dear Sir: Weave bin weighting with baited breath for your next bout with the homonym demon. Sure enough, you came threw in grate stile in the April issue (page 94). Magellan's "sewing of the seeds of Christianity" leaves know doubt that literacy still rains supreme at SMITHSONIAN.
Robert L. Hosman
Sherwood, Arkansas
Your write. Wee kneaded two bee needled on this won. Ed.

Mortgages

Dear Sir: My mother's brother bought a new house in the early 1920s, a nice two-story brick. Some women in the family predicted that he and his wife would "never live to pay off that mortgage."

Much later I told my aunt about the years-ago gossip and asked if she would tell me what they paid for the house. She replied, "The builder sold it to us for $5,000 and knocked off $500 if we would finish the woodwork."
Bud Lunn
Highland, California

Dear Sir: In his article, Brock Brower mourns the decline of mortise-and-tenon joinery used in traditional timber-frame construction, then comments, "Basically, all you needed for a 2-by-4 balloon frame was a man with a hammer and some nails." Speaking as a roofer and



THANK GOD SHE LEFT THE LIGHT ON

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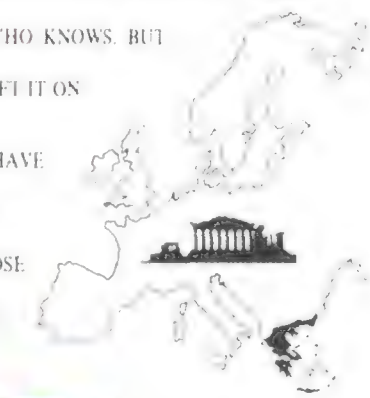
THE GODS COULD HAVE CHOSEN LIGHT FROM ANYWHERE. THEY CHOSE THE LIGHT OF GREECE



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renovation specialist, I suppose all anyone needs to become a published writer is a pencil and some paper. Brower insults the home building industry in general, and carpenters in particular. Keep in mind the phrase "measure twice, cut once."
Stephen E. Hazlett
Akron, Ohio

Dear Sir: All too often the insurance industry has been criticized unfairly by misinformed reformers. Brock Brower could have credited it as the principal source of investment funds that made home ownership and tenancy possible for millions of Americans.
Vincent Patrick Doyle
Saint Helena, California

Dear Sir: Brower invokes many of the pangs and pleasures of mortgages but neglects the ritual known as The Closing. I'll never forget my first one, at a big table crowded with strangers, all of whom seemed to have legal claim to my pitiful supply of cash or credit. And then the moment came when one of them got up and said triumphantly: "All right. I've got the Power, the Title and the Satisfaction." With those resounding words it was all over but 30 years of monthly payments.
Frederick Otto
Milwaukee

Dear Sir: I was director of the Federal Housing Administration Regional Office in Buffalo, New York, in 1963. One day, talking with the vice president of the Buffalo Savings Bank, I mentioned that we were planning a commemoration of the 30th anniversary of the signing of the National Housing Act. He laughed and said, "I remember the bank president, in 1943, asking the directors what policy should be on the new FHA mortgages. There were comments like 'Who ever heard of a fully amortized mortgage?' and 'I'm against these damned newfangled mortgages.' Finally the president said, 'Gentlemen, we should agree to take these new-type mortgages to show that we want to help our President get the nation out of the Depression.' So $250,000 was allotted for FHA mortgages."

I asked, "Now, 30 years later, how much does the bank have in these 'newfangled mortgages'?" He replied, "$300 million."
Warren Thurber
Bradenton, Florida

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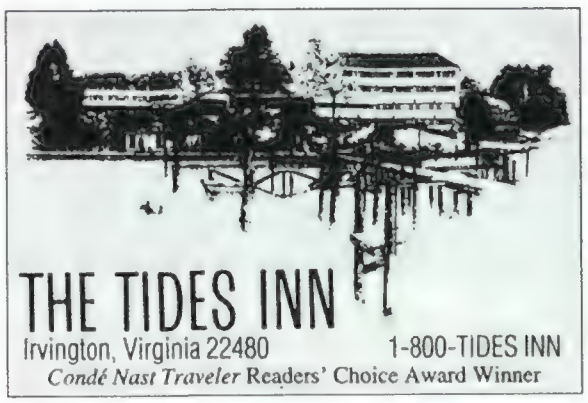

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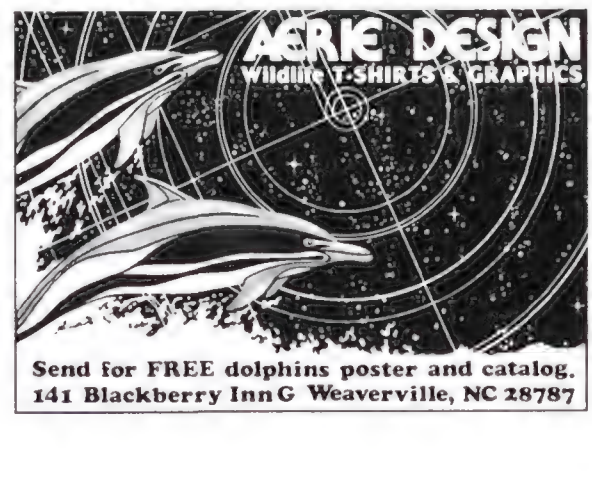

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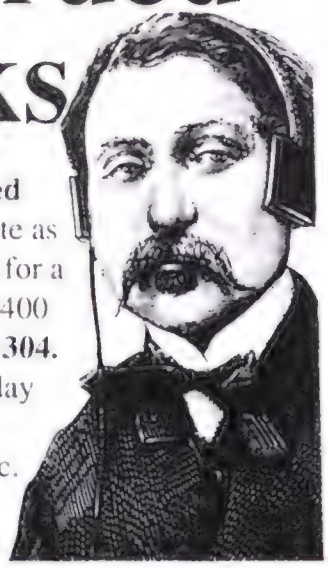

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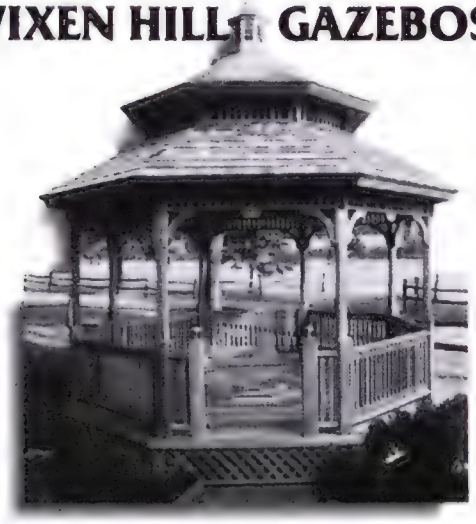

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Around the Mall and beyond

The dragger *Defender*, 119 feet overall, 198 tons, sailed out of Rockland, Maine, one day early last winter on what her skipper, James Dow, thought would be just another fishing voyage. The vessel is relatively new and efficient, rigged to drag a heavy trawl along the ocean bottom. Usually that means Georges Bank, the famous old fishing locale about 100 miles east of Cape Cod. Dow works her across it, trawling maybe 60 fathoms deep, and around its edges in deeper water. You often see pictures of this: the fishing vessel inching along in the open sea, her high bow saluting the gray Atlantic swells with a deep nod, a burst of spray, then a rise to meet the next. That's the way it was that cold winter day with the *Defender*.

At intervals her crew would winch up the net, dump its contents into a holding tank, then lower it again. A conveyor moves the fish from there to be processed and stowed below. This day it was cod, mostly, but also some pollack and hake and other fish. "We generally bring back some 60,000 pounds," says Captain Dow.

This time, he brought something else.

"I was in the wheelhouse, keeping on course," he explained to me over the phone. "We'd gone off the northern edge of Georges into Georges Basin, about 135 fathoms. Then the engineer came topside and poked his head in and said, 'You ever see a seven-foot squid?' I thought he was kidding, but he talked me into going below for a look. And here was this thing down there, in with all the cod, staring up at me."

Squid come in various sizes, mostly small. Seamen have always yarned about giant squid so big they could sink a vessel, and the true giant squid, *Architeuthis*, with its two tentacles extended, can reach 60 feet and weigh up to 1,000 pounds. It could sink a canoe, all right. Maybe even President Bush's speedboat. But Captain Dow's seven-foot deep-sea squid was big enough for him. Caught as the net was hauled back to the ship, it lay there among all those cod, looking like a 16-year-old in the second grade.

Marketing instinct tells any commercial fisherman to chuck such a huge oddity overboard. Keeping it takes up stowage space that should be filled with things that bring moola at the fish counter. But Jimmy Dow, bless his salt-encrusted heart, thought first of science. How come? Because, folks, he and his wife, Kathy, his brother Stephen and crewman Andrew Martin are regular readers of this very magazine.

Figuring it might stir a little ecstasy in scientific circles, Dow and his crew carefully wrapped and iced down the strange monster of the deep, and stowed it in a special place in the hold. There it remained, dead but undamaged, until the *Defender* reached the John B. Wright Fish Company of Gloucester, Massachusetts, where she unloads. Just a few blocks away is the National Marine Fisheries Service (NMFS), where the squid's body was donated to science. They in turn called upon the experts at the Smithsonian to share in the study. And it was there that Clyde Roper and I met "Tanya," short for her enticing Latin name, *Taningia danae*.

Alive and well, Tanya might have been the belle of a senior prom: gently curved torso, entwining arms, big, lustrous eyes. Her date would have found a few drawbacks, however. She has six more arms than other girls and they're fitted with sharp hooks to grasp food. She'd devastate the late supper, and her embrace in the backseat would leave your rented white dinner jacket in shreds.

To Clyde Roper, curator of mollusks at the National Museum of Natural History, Tanya will always remain one of the world's most beautiful females. He was all but slavering for her as we drove to Gloucester in early April to bring her down to the Smithsonian.

Clyde knows far more about these invertebrates than this magazine has room to publish. But twice I've scraped a little off the surface of his expertise to fill columns, one on the giant squid that's on display in the museum (April 1983) and one on his work in Australia,

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especially on the poisonous little blue-ringed octopus (May 1987).

He loves such creatures, mostly for their many mysteries, but I think, too, because he spent his formative years lobstering off Rye, New Hampshire, and brine still thickens his bloodstream. "It's always exciting to get a big squid," he told me as we drove north from Boston. "This one sounds as though it could be in really good condition, with its hooks and light organs intact." I had no idea what he was talking about, and was more concerned with the growing certainty that, as navigator, I had gotten us lost. Gloucester's streets reflect the whims of people who first rambled across the hills and through the blueberry patches of Cape Ann in 1623. Delightful. Also frustrating.

We asked directions of a sturdy Yankee walking with a seaman's roll. He provided a spate of them, leaning amicably against the car, holding his brown paper bag carefully upright, lest he spill a drop. When he set off homeward (listing to starboard) we were left more bewildered than ever.

Fortunately, the old fishing town simply isn't big enough to conceal the NMFS lab forever. At last we were being greeted by Chris Martin, a marine biologist who has known Clyde for many years now. He asked Clyde to brief the lab staff about squid. I eagerly audited the crash course, and from it stems everything I say about squid from now on.

At last we opened the freezer to meet Tanya. "Frigid" was the word that sprang first to mind, for she'd been wrapped in plastic and frozen solid at 0 degrees F. But what an impressive lady! A brick-red, cylindrical body stretches maybe five and a half feet; those eight arms add another foot and a half. Weight: 135 pounds.

Deepwater squid of this size, some even a little longer and a few pounds heavier, have been found in the bellies of sperm whales. But Clyde thinks it's safe to say that the Smithsonian's new treasure is the largest of this species in such a perfect state of preservation ever to be landed in the United States.

Squid, which belong to the class of cephalopod mollusks, grow ten appendages: eight arms, and two long tentacles that shoot out and seize food. But *Taningia* belongs to a family that loses those tentacles early in the juvenile stage. The arms are lined with small brown hooks that can snag prey—a fish or smaller squid—and thrust it into the mouth. Two arms are tipped with the light organs, or photophores. These produce brilliant flashes of light, the bioluminescence of many kinds of ocean animals.

Roper and a colleague were the first scientists to measure the light-flashing phenomenon in this species. He told of the first verification of it: "We captured a squid—much smaller than this—and kept it in 37-degree F water, in darkness, to match the middepth region where we netted it. Because I come from New Hampshire, I was elected to reach into that cold water in the darkness and feel for the squid. I swished around, thinking of all those sharp hooks down in there, and I brushed against it. Two great flashes of light came from those photophores and startled me so that I snatched my hand out of the tank and drenched everyone else with ice water."

Each bulb has a seam down the middle that opens like an eyelid for a frac-

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NMFS agent Don Mason verifies length of Tanya, the squid donated to science.

tion of a second to produce a strobelike flash. Its purpose is clearly to startle predators (like Clyde) so that the squid can get away.

Taningia's hooks and sharp black beak are bone-hard chitin. It's one of many squid that have suckers—"same principle as a plumber's helper," points out Clyde—and these muscular cups are rimmed with chitinous rings of tiny sawteeth, allowing the squid to hang on for dear life when they grab their prey. Giant squid, such as our specimen in the Museum of Natural History, are known for leaving round scars on sperm whales, their chief predators, after losing a writhing, gargantuan battle.

Tanya's beak is extended, indicating that she probably bit at the trawl net that caught her. Her beak, which looks almost like a parrot's, is capable of slashing her prey into digestible bits. Then the raspy tongue rams it down the tooth-lined throat on its way to the stomach. "Every feeding tool points down the gullet," says Clyde. "Once a fish is snagged, it's got only one place to go."

The creature has tapered fins that ripple as they help propel it through the water. All cephalopods can put on a burst of speed by driving a jet of water out through a funnel that bends in any direction. Thus they can dart quickly forward (that is, arms first) or backward, and swing left, right, up or down, or simply hover.

Tanya has a fully developed female egg gland that was ready for mating. Clyde said later tests would show whether or not she'd already mated. She's fully adult and about fully grown. "They grow fast," said Clyde. "Most squid live only a year or so—the giant lives maybe five years. Tanya might have gained a few pounds and a couple of inches, but once she spawned, she'd have died anyway."

That thought depressed me. I brightened when Clyde added that though these squid have only one spawning season, they may mate several times. Also, they have quite huge brains with many lobes that keep them alert to predators—and to fishing nets. That could be one reason why they are so seldom captured by humans.

Overwhelmed with squid lore, I was glad to get away for dinner with Clyde,

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Chris and Don Mason, the NMFS port agent who serves as liaison between the lab and the fishing fleet. Since I hadn't heard anything intimate about cattle that day, I had steak. It was every bit as good as calamari.

Next day at the crack of dawn we backed our van to the loading dock of the lab, eased Tanya into a Styrofoam box with a wooden base—the lab got it from a local undertaker—and shoved this into the van. We noted that the windows were darkened. The funereal look seemed only proper. We lacked only half-drawn curtains and fake flowers.

It was a long but not unpleasant drive down to Washington with our catch of the year. There was one blemish. We were stopped by a Massachusetts state trooper for, well, going a little too fast. While he was writing a ticket, we looked at each other with the same wild surmise: Should we tell him we have a body in the back?

But he seemed like a pretty tough cop, all business, and we chickened out. Tanya made the trip undisturbed, seemingly just as frozen as when we started.

Investigative work began on our new friend immediately. Gleaning the details of her final hours, Clyde and his NMFS colleague Mike Vecchione are hoping to find out, among other things, just what she ate for her last meal. Plans are to put Tanya on display as soon as a proper container can be made, perhaps later this year, so don't miss her.

Edwards Park

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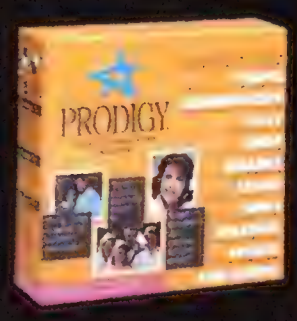

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Phenomena, comment and notes

Tree study means getting to the top of things: Smithsonian biologists are trying out a new way to work there

You are a bird, flying among the trees in extreme slow motion—silently, effortlessly moving in three dimensions. The law of gravity has been repealed as you pause in midair to watch ants around the sap oozing from a bud at the very tip of a branch, then soar up and over the tree to float down into a shaded cove on the other side. One moment you admire the iridescent colors on the tiny, stingless bees pollinating orchids; the next you hover above an iguana sunning itself in the tangle of vines that have taken over the treetops. A white-necked puffbird allows you to approach within three feet: it stares but does not move. A little farther away a black vulture pays no attention whatsoever. Then you go swooping off again, over some trees, around others, moving like a diver among coral heads. You drop down almost to the ground a hundred feet below and then rise magically, up and over the treetops. All too soon it ends, your feet touch the dirt, and once again you are a creature of two dimensions rather than three.

Everyone has had the dream. A child looks up into the treetops and sees a world he cannot reach. An adult walks along a bridge that crosses a ravine and finds himself stopping where the ground has fallen away enough so that he is on a level with the treetops; his mind soars out into space. No birder can watch the objects of his affection for very long without realizing anew just how nailed to the ground we are by gravity, and dreaming for a moment of slipping the surly bonds.

Biologists have the same dreams, only more so. A tree is a device to capture solar energy: to really understand it, they have to be able to get to where photons meet chlorophyll. It is at the very top and out at the very tips that new leaves grow, flowers blossom, pollinators work their magic and herbivores wreak their havoc. Trying to work with only the flower petals, seedpods and chewed leaves that fall to the ground, one botanist explains, is like being a marine biologist who works only with what washes up on the shore. For decades terrestrial ecologists have tried to rise to the challenge. They have climbed the trees themselves, risking close enounters with bees, wasps and snakes. They have shot lines over high branches and hauled themselves up in bos'n's chairs. They have strung cables (SMITHSONIAN, June 1980) and even entire walkways from tree to tree. A group in French Guiana has experimented with what looks like a life raft that is dropped onto the treetops from a small blimp. All have limits to the access they provide.

Now biologists at the Smithsonian Tropical Research Institute (STRI) in Panama are trying a new approach. Allowed $40,000 in his budget to study the feasibility of using a tower crane for canopy research, Alan Smith, STRI assistant director for terrestrial research, simply rented one from a Panama City construction company and had it installed in a nearby park. The crane is just off a dirt road that follows the Las Cruces Trail, over which Spanish explorers carried gold and silver from Peru to ships waiting on the Atlantic side of the isthmus. For nearly a year now biologists of every persuasion have floated through the trees, placing their instruments and traps exactly where they have always wanted them.

The crane, just like those working in most cities around the world these days (SMITHSONIAN, September 1985), stands 100 feet high, well above the canopy of a dry forest that is only about 70 years old. The boom extends 115 feet, which means that the scientists in the gondola can move anywhere in a cylindrical space 230 feet across and 100 feet high. José Herrera, the operator, spent four years building high-rise condominiums in Panama City before he took the job in Metropolitan Nature Park. This job takes a lighter touch, he says: you can't swing a gondola of biologists around like a bucket of concrete. And unlike a construction site, which is clear of all obstacles save the building itself, Herrera often has to work without being able to see the gondola. Not only does he prefer the peace and quiet of the forest, however, he has even bought a pair of binoculars and keeps an eye on the wildlife while the scientists go about their business.

The gondola is a steel-floored wire cage large enough for two people and their equipment. The railing is about waist-high; above it are screened half-

In a park outside Panama City, STRI ecologists ride the gondola of a tower crane to learn firsthand how life works in the canopy.

doors on all four sides, some of them with aluminum foil as well to keep out the sun during a long session. Some scientists take a climbing rope with them for use as an emergency exit, but the only "emergency" in the first nine months of operation was a 30-minute power failure.

You get in the gondola on the ground, by walking up a few concrete blocks and then climbing over the railing. When everybody is ready it's thumbs-up to Herrera, and suddenly you are rising through the air, in perfect silence, the understory dropping away beneath you. You glide upward among taller trees, seemingly unaffected by the large, pendulous ant and termite nests that hang off them. At the top comes the only surprise for a first-timer none too comfortable with heights: when the gondola begins to move out on the boom, it starts with a jerk that sets the gondola swaying—I clutched as tightly as I've ever held an airplane armrest. Otherwise you quickly forget the crane itself and stand facing the direction in which the gondola is moving, sailing over the trees as in a dream.

Now, finally, you are sunlight looking down on the trees. Here you are starting at the beginning and can hope for a new and better understanding of the most basic ecological cycles: the flows of energy and materials, the relationships of producers and consumers. To the eye of the totally uninformed observer, there is no rhyme or reason to any of it. No two species are doing things the same way. This is a place not just of competing trees but competing strategies. Some, for example, like that pseudobombax (a member of the kapok, or silk-cotton, family) over there, have dropped all their leaves in this, the dry season. Others, like the cecropia, with its hollow, chambered ant-condo branches, are just putting out new leaves on bare branch tips. Then there are trees putting out a whole new layer of leaves over the old, chewed ones, to capture as much sunlight as possible before the clouds of the rainy season roll in.

Even the leaves are totally different, from the feathery, mimosalike fans of the *corotu* to the heavy, elliptical leaves of the wild cashew (known as *espavé*, supposedly from the Spanish *es para ver*, "it is to see," the wild cashew was the tree Spanish explorers climbed to see where they were).

In the tops of some trees, the woody vines known as lianas have grown so thick that the underlying tree would appear to be in mortal danger. And this was one of the first surprises to come from going up in the crane, according to Alan Smith. More than 35 percent of the canopy is occupied by lianas, he said, far more than expected. It had been the conventional wisdom that because the crowns of trees sway in the wind and abrade their neighbors, there would have been selection for leaf toughness, so one tree could grind out more space for itself. But the lianas lace the treetops together so that several trees move as one and there is little abrasion.

Alan Smith (left) and Geoffrey Parker run tests on leaves of a wild cashew.

Another surprise was the extent of herbivory. When an entire leaf is eaten at the top of the canopy, a biologist on the ground has no way of knowing it ever existed. If STRI can install a crane permanently, Smith said, biologists will be able to measure the herbivory and identify most of the perpetrators. One perp leaves a trademark: leafcutter ants (SMITHSONIAN, October 1984) cut a scalloped pattern along the central rib of the leaf; they laboriously carry the small pieces of foliage all the way down the tree and across the ground for many yards to their nests.

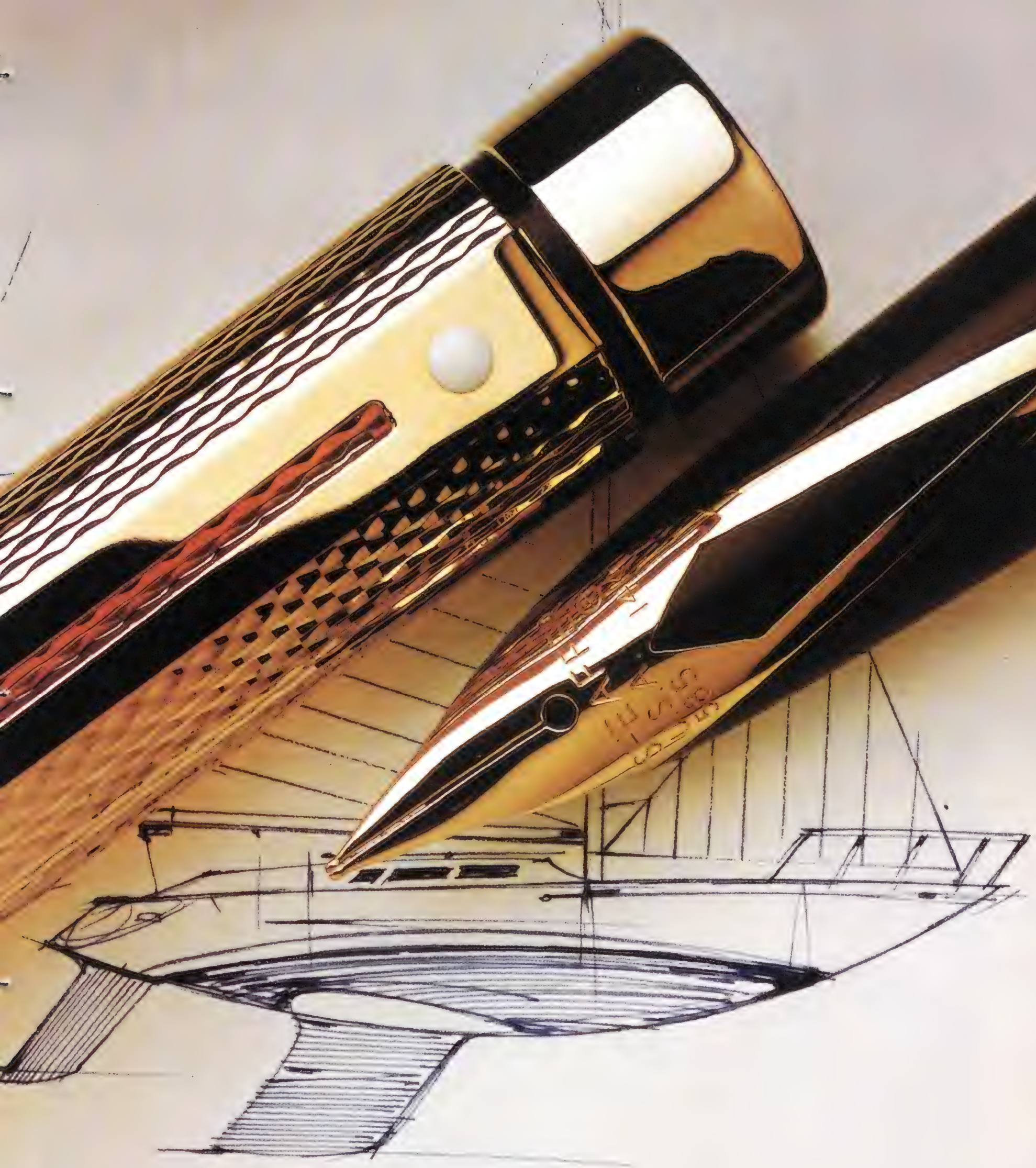
Basically, the plant ecophysiologists want to know more about how tropical plants respond to their environment: Why, for example, do some trees in this always warm region drop their leaves during the dry season? It could be a way for the tree to rid itself of all its herbivores and their eggs in one fell swoop. Or it might be a way to stop cavitation, a life-slowing situation in which the tree's water-circulation system breaks down. Trees pull water up from the roots through a system of vessels called xylem. During the dry season, however, the pull may break these thin columns of water inside the tree, leaving embolisms. Dropping leaves stops the pull and avoids the danger.

Other questions of great interest are how plants cope with the potentially damaging effects of strong light and low moisture (in the dry season) on the uppermost leaves of the canopy. Some plants simply turn their leaves so as to absorb less light. Others are able to shunt excess energy from critical leaf enzymes. Strong sunlight is beneficial, of course, if the leaves can stand it and can make enough enzymes. It is costly, however, for plants to provide the extra enzymes needed to take advantage of such high light levels, and they may lose much of what they accomplished in daylight during nighttime respiration.

Each day that I was in the gondola, two Panamanian research assistants from STRI worked on the ground beneath us, measuring photosynthetic activity of leaves in the understory. Their instrument encloses a leaf and subjects it to different levels of light, carbon dioxide and humidity. It then measures the resultant activity. When we left, the women would rise into the sky to make the same measurements in the canopy.

On my final flight with the arbornauts, ecologist Kevin Hogan talked about finding out what attacks flowers and seeds at what stage, and especially about predation on seedpods: beetles that bore their way in, monkeys that tear them apart to get at the grubs laid by the beetles. Some trees tend to build very hard, protective pods and only mature the seeds at the last moment, he said. But no one can yet say whether a tree drops an insect-ridden pod because it is insect-ridden.

The crane has already been used to map the forest canopy. Geoffrey Parker, from the Smithsonian Environmental Research Center in Maryland, and Alan Smith moved the gondola along the boom, recorded the height and species of the canopy below, then moved the gondola a few feet and repeated the



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process. At the end they produced a "topographical" map of lianas and trees.

That afternoon I boarded an old excursion boat in Gamboa, rode up the Panama Canal for an hour and stepped ashore on the hallowed ground of Barro Colorado Island. On any map of where tropical biology is done in the world, this is one of the major capitals. A research station since 1923, its trails and buildings are named for the giants of the field who worked here, now to be met only in textbooks. And it is here in this rain forest, so well studied from the ground, that STRI would like to build its own permanent tower crane.

The people here have tried other ways to study the canopy. George Angehr, an expert on hummingbirds, led me up a 138-foot meteorological tower, a steady staircase inside steel scaffolding. (He tells the story of watching a hummingbird leave a nest 70 feet up and simply drop toward the ground, fluttering from side to side like a falling leaf. Near the ground the bird suddenly shot away in normal flight. The behavior, presumably, avoids calling attention to the nest.) On the way up I saw that almost every leaf within arm's reach had been tagged and numbered, but at the top the foliage is out of reach; all there is to do is hang on tight and enjoy the view. Another stairway to the sky is even taller. Gerhard Zotz, a German researcher, has lashed a triangular radio mast to the side of a ceiba tree. It's about a 110-foot climb to his platform on the lower branches (he is studying a hemiepiphyte, an air plant that dropped roots to the ground and has become a tree) and another 45 feet up the tree to a vantage point above the canopy. (Even with his kind offer of a climbing harness, I made it very, very clear that my tight schedule did not permit a climb that day.) In the 1920s, another researcher, I was told, had simply hammered railroad spikes into the side of a tree and climbed them like a ladder. But none of these towers moves.

On the island I saw a little bit of many things. One man is studying the complicated relationships of wasps and nematodes inside wild figs. Another is teasing out the physics of why butterflies fly the way they do. A Colombian scientist is performing laboratory experiments on cavitation. A Belgian is working on termite caste systems. A Panamanian is seeing how the same plant will put out one kind of leaf in shade, another in sun. One of the most ambitious projects is the 125-acre study plot, on which every plant one centimeter in diameter or larger is censused every five years. This is real population dynamics, with 250,000 individuals of more than 300 species to follow.

Walking the trails (and making my own personal collection of ticks), I looked in wonder at keel-billed toucans and white-faced monkeys, delicate air plants and the 20-foot-high buttresses of ceiba trees. For someone who has spent decades editing other people's stories about tropical forests, it was indeed a dream come true. Yet as I plodded along, sweating happily, I found myself peering through the trees for the bright orange, totally unnatural crisscross pattern of a tower crane. How're you going to keep us down on the ground, once we've been up in the trees?

John P. Wiley jr.

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Plant ecologist Robin Foster, on the trunk of a felled ceiba tree, surveys an old forest area now denuded by logging, farming, erosion. RAP's primary study site (opposite) has already been disturbed by farmers.

By Richard Conniff

RAP: on the fast track in Ecuador's tropical forests

In a race against time, an ecological SWAT team mounts a Rapid Assessment Program to discover what should be—and can be—saved

They were like scholars in a great museum that was crashing down around them. They worked among the disappearing treasures with efficiency, dispatch and even humor, as if a lifelong student of antiquities could carefully record the exquisite details of a Greek amphora and then watch with equanimity as someone hammered it into dust; or as if the world's leading authority on Chippendale furniture could note the particulars, then stand by as side chairs and highboys were smashed to splinters around him.

What these researchers were cataloguing was only ostensibly less precious—one more rain forest being chain-sawed into oblivion, with no more than the usual assortment of plants and animals produced by millions of years of evolution and found nowhere else on Earth. The researchers were accustomed to this kind of destruction. They spend much of their time studying forests like this one and seeing them vanish.

A few hundred yards up the trail, a botanist named Al Gentry follows a tape measure through the forest, calling out the names of species in a 160-foot-long transect. The day before, a bulldozer cutting a logging

Photographs by Randall Hyman

road knocked down one end of the transect while Gentry was still working at the other. Now the bulldozer is once again pushing perilously close, and trees are crashing down nearby. Gentry, whose strategy toward all hazards is to pretend they don't exist, is hastening toward the finish when he spots something up a tree that he must collect. An assistant reaches up with a long, wobbly cutting pole to retrieve it—unsuccessfully. Since the tree is coming down for the logging road, the assistant hacks away with his machete. At the crucial moment, with the bulldozer operator yelling for them to move, and the tree beginning to tilt, Gentry loses his footing and slides down the wet slope.

"*Cuidado! Cuidado!*" someone shouts. "Watch out!" The tree comes thumping down, close enough for Gentry to reach out for the specimen. "Oh, that's *Gongora*," he declares, as casually as if he has just spotted an old acquaintance on a city street; a kind of orchid, more delicate than a string of Chinese lanterns, with 18 little yellow-and-red-speckled flowers hanging in a chain. It is one small clue to what this forest on a coastal ridge in western Ecuador is all about.

It is also a slightly extreme instance of what people mean by rapid biological assessment, a hot idea in the environmental community just now. Gentry is here on behalf of Conservation International, a Washington, D.C.-based group, which implemented its Rapid Assessment Program (RAP) to fill a widely acknowledged void in the movement to save the rain forests: for all the attention the issue has received in recent years, nobody really knows what's out there. In allocating their limited resources, conservationists have little scientific basis for choosing one forest over another. A rain forest is more likely to get protected—if it gets protected at all—because nobody else wants it just then, rather than because of its biological value. To fill in the blanks on the map, RAP employs some of the world's most knowledgeable tropical field scientists and sends them on quick sweeps to assess vast threatened regions.

RAP's goal: biology on the quick

The mission in Ecuador is typical. In little more than a month, a core team of four U.S. scientists joined by three from Ecuador are to survey the 250-mile coastal range between Guayaquil and Esmeraldas, determining what areas have survived deforestation, which plant and vertebrate species still live there, whether any are endemic, and what the conservation priorities should be. The RAP team, which conducted its first survey last year in Bolivia, aims to make a dozen such sweeps in different countries over three years.

It is biology on the quick. RAP aims to see the big picture now and act on it, while there is still time. The program has been called "an ecological SWAT team" and a "Bio-squad," terms with an infelicitous suggestion of do-good gringos in jackboots. Conservation International's approach, on the contrary, is to turn its findings over to the country in question, and raise funds and judicious pressure to help local groups develop a practical environmental response.

The four permanent members of the RAP team are extraordinary. Gentry, 46, is senior curator at the Missouri Botanical Garden and is often introduced at speaking engagements with the flat assertion that he knows more tropical plants than anyone who ever lived. He is a tall, gangly figure who dresses like a motorcycle mechanic, in a sap-stained T-shirt and blue jeans that are tattered at the cuffs from chronic tree-climbing. His eyes are bloodshot from staying up till 2 A.M. pressing botanical specimens; they give the unsettling but entirely accurate impression that he will do anything to get to a plant. Bitten once by a venomous pit viper four hours by boat from the nearest village, his first reaction was annoyance that he would be losing field time. The snake died; Gentry didn't.

Ted Parker, a 38-year-old research associate at Louisiana State University's Museum of Natural Science, is

Writer Richard Conniff found it tough to keep his tent—and himself—clean on expedition. He took siestas with his muddy lower body lying outside.

Pack train bearing supplies for RAP's main camp slogs along recently bulldozed road. Above, Robin Foster, boots mud-caked, studies maps on which he pinpointed plant groups from airplane. His on-ground forays help determine why each forest is unique.

Gentry's equal in ornithology. He can identify most of the 4,000 bird species of the Neotropics, or New World tropics, by their songs alone—for example, picking out the subtle differences that distinguish each of the 370 kinds of tyrant flycatcher or the 300 or so different antbirds. "A lot of people say they sound the same," he says. "But to me, every note is distinctive." This phenomenon tantalizes and also strikes fear into the birding world; Parker first made his name when he visited a heavily studied site in Peru and promptly identified 15 species his colleagues hadn't noticed in a dozen years of research.

The RAP mammalogist is Louise Emmons, 47, a Smithsonian research associate. Her colleagues like to recount how a radio-collared jaguar once stalked her in a Peruvian rain forest at night as she walked to camp, a tracking receiver clicking furiously in her hand. But Emmons disdains the story for its emphasis on charismatic megafauna; she prefers to explore how unglamorous squirrel species partition their habitat in the rain forest of Gabon, or how tree shrews live in Borneo. Her *Neotropical Rainforest Mammals* is the only comprehensive field guide for distinguishing among the Western Hemisphere's 18 genera of rain forest rat, for example, or the 13 species of porcupine.

The fourth member of the team is Robin Foster, a 46-year-old plant ecologist with the Smithsonian Tropical Research Institute (STRI) in Panama (see page 29) and the Field Museum in Chicago. Foster is known for the most thorough long-term study of rain forest dynamics ever attempted: he and a hundred assistants tagged, identified, mapped and measured—and now periodically revisit—250,000 plants on a 50-hectare plot at STRI's Barro Colorado Island station. He is adept at looking at a forest from a satellite image, an airplane overflight or a road two miles away, and judging what grows there and whether it is old-growth forest. If a paramilitary metaphor is inevitable, then he is, among other duties, the reconnaissance man for what is, in effect, a search-and-preserve mission.

In early February of this year, near the end of the longest drought in Ecuador's history, the countryside around Portoviejo is a dust bowl. Every hillside is denuded, and fissured by erosion. Here and there, commercially worthless ceiba trees, the last remnants of the old forest, lie on the bare fields where farmers have cut them down and burned their branches. The huge lime-green trunks, with their sinuous ridges, look like slaughtered elephants. "I've never seen it this bad," someone remarks. Someone else recalls the deforested hills of Greece and the overgrazed landscape of the American West—comparisons that are flawed only because of Ecuador's superior biological wealth. With an area nearly the size of Nevada, it possesses

Ornithologist Ted Parker motions for silence as he tapes bird sounds on his extremely sensitive directional microphone and recorder, in the Río Palenque reserve. He can identify nearly all of the 4,000 bird species of the Neotropics by songs.

more plant and bird species than all of North America.

Parker and Foster are scouting ahead for their next study site, while the rest of the team finishes up in the south, at Machalilla National Park. This region, the densely populated western half of Ecuador between the Andes and the Pacific, has already lost 95 percent of its forest, most of it in the past 20 years. But Foster knows from an overflight in December that patches remain on the ridgetops of the coastal mountain range, which the floodtide of human population may not reach for another year or two.

RAP has chosen this unpromising terrain because the isolated ridgetops may contain the last pockets of endemic species that have otherwise disappeared from western Ecuador. Apart from their biological interest, these pockets may also prove of long-term human value. They may include commercially valuable species—a seed stock for developing some more-sustainable way of life when the short-term advantages of clear-cut logging, uncontrolled hunting and subsistence agriculture inevitably fail.

But on the road north to Pedernales this hope dims. With Parker at the wheel, the car bucks and lurches for hours across rough dirt roads, past vegetation that has been nibbled to the root crowns. The endless goat and cattle trails cut a sagging lattice pattern into the powdery face of every hill. The mangrove swamps have been flattened and converted to rectangular shrimp-farming ponds. In the dusty little town of Jama, the owner of an open-fronted corner store explains that he has seen the forests disappear in his lifetime because of agrarian reform. Beginning in 1964, reform made undeveloped land available for the taking; the claimholder was obliged only to clear the land and put it into production quickly, or risk government confiscation. The storeowner acknowledges the parched, oven-like atmosphere with a gesture of resignation and adds that since the forests disappeared the rains have not come. Parker and Foster push on to the north. In 14 hours of driving they encounter only one sizable piece of forest, on Cerro Pata de Pájaro, or Birdfoot Mountain. It is smaller than Central Park in Manhattan.

Parker resists the suggestion that saving such a meager remnant would be futile. If Birdfoot Mountain were an oceanic island, he says, biologists would be all over it in search of endemic species. But by the time the entire team regroups, his frustration with the threadbare scene pushes to the surface: "It's gone. Believe me. There are patches of two or four or five hectares you can work in. But it has no conservation future."

"For birds," Foster agrees mildly. "But for plants?" They decide to head north, where the climate is more humid and the forest less hospitable to human invasion.

Regrouping offers a brief opportunity to recover. Emmons, who picked up bubonic plague on the Bolivia trip, is now fighting headaches and fever of unknown origin. A rich medical history appears to be one of the chief rewards of field research, along with uncertain pay, troubled marriages and frequent arrests (Gentry has been jailed 15 times, usually for seeking plants in the wrong place at the wrong time). Among them they have endured malaria, encephalitis, filariasis, leishmaniasis ("The best thing is, it eats your cartilage"), hepatitis, botflies ("Chew up a cigarette and stick it on the point of entry"), arboviruses, giardias, worms, amoebas, and assorted bites and stings. Emmons

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shrugs it all off. She says the biggest danger in the rain forest is that a branch will drop on your head.

Parker is still despondent as their search for a forest suitable for preservation continues unsuccessfully. What he really needs, Foster suggests, is a medicinal dose of 80 bird species in song, applied twice daily. What all of them need is the consolation of a rain forest.

Their luck doesn't change till three days later, south of Esmeraldas, when Parker stops the car, looks out at distant blue ridges and says, "There it is." By good (or not so good) luck, they find a new logging road into the heart of the forest. As he bounces in his seat, Parker mutters to himself like someone coming out of image deprivation: "This is forest. There are birds here. There are more plants than you know what to do with." Foster, more circumspect, studies the treetops. "That's good," he comments. "Lots of virolas. They're taking stuff out, but there's lots still intact." Farther in, he adds, "A lot of things I've never seen before."

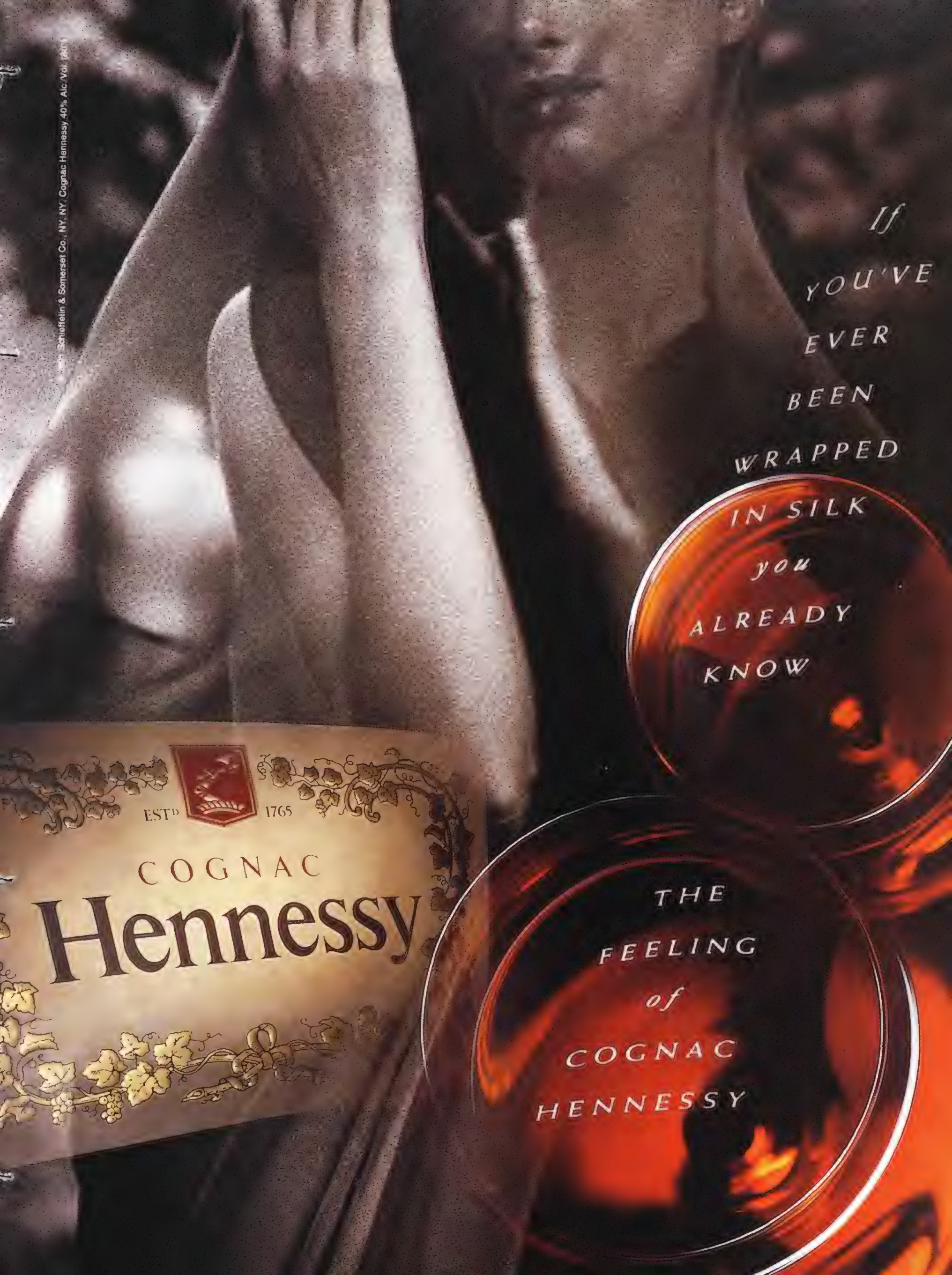
"I gotta listen," says Parker. "Oh, man. This is gonna be great. Oropendolas. All the tanagers." Later, on foot, he says, "That accelerating sort of staccato is a blue-tailed trogon. I've never heard it before." How, then, does he know what he's hearing? "Because it's the only Neotropical trogon I haven't heard." A moment later, by way of proof, a big black bird with a metallic blue tail lights on a nearby branch. But Parker is already off among the songs of rufous pihas and flocks of big parrots raucously calling to one another across the road. The others find the logger at work and make arrangements for the RAP team to return the next day. Noting the softness of the road on the drive out, Parker says, "Just hope it doesn't rain tonight."

The rainy season, of course, begins before dawn—torrentially. With the road now passable only by hiking through ankle-deep mud, the true romance of field research begins to impress itself on everyone. During the next four days of continual rain, the RAP team is all over the forest, sodden but methodical about taking its measure. Ecuadoran Luis Albuja, the authority on his country's 125 bat species, rigs his mist nets. Emmons baits 50 box traps for small mammals and hides them in the undergrowth. Gentry sets up a transect to make a detailed sampling of one-tenth of a hectare of forest before the logging road can claim it. Foster heads out into *bosque puro*, the intact forest, on daylong hikes to assess the area's large-scale ecology.

The team is camped with the logging-road crew, and the combined traffic produces a quagmire. People struggle to remain upright and in forward motion, walking gingerly, as if they have just had casts removed from both legs. Having slogged through the mud all day, many of the researchers strap on headlamps and hike out again at night. Albuja visits his nets to delicately untangle fruit-eating bats with needlelike teeth and leafy noses. Emmons walks alone in the underbrush, dead slow, listening for mammals and looking for their telltale eyeshine. Conservation International's team coordinator John Carr and Ecuador's Ana Almendariz, both herpetologists, seek tree frogs along the sides of the trails. Headlamps move across the foliage in robotic slow motion.

Under a tarp at the camp, by the phosphorescent white light of a lantern, Gentry is pressing plants, which means that he is slapping leaves, fruits and flowers between the pages of a local newspaper, *El*

In Esmeraldas forest, mammalogists Louise Emmons and Luis Albuja set a series of live traps for small mammals. Albuja, machete in hand, holds a banana to be used as bait. Traps came up empty; Emmons spotted only a few howler monkeys, squirrels, kinkajous, on her walks. They speculate uncontrolled hunting and a long drought are to blame.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Saving rain forests on the quick

Telégrafo, wherein an op-ed columnist inveighs against "*Ecológismo exagerado.*" As he works, Gentry is talking about a site he and a colleague once studied in central Ecuador. On a ridge called Centinela, near a small, privately owned reserve called Río Palenque, they identified 900 plant species, including about 100 found nowhere else. Then farmers clear-cut the ridge, reducing it to bananas and perhaps 30 species of weeds. He holds up a red, podlike flower, with a fluted undersurface. "This is *Gasteranthus*," he says. "Stomach flower. You can see why it was called that. And I think it's a new species. Anyway, I've never seen it. There are 24 species, and 6 of them are endemic to Centinela. So they're presumably extinct."

He speaks without bitterness or other emotion, except a kind of detached, driving intellectual curiosity. As the group had hoped, plants that are gone from Centinela and other areas of western Ecuador are turning up here, mixed in with plants from the rich Choco forest of western Colombia, and with new species found nowhere else. The character of this forest is beginning to take shape in the group's collective mind.

Among other things, Gentry has seen several Río Palenque mahogany trees, a species often cited as an instance of the mindlessness of unchecked deforestation. The tree was the most commercially valuable timber in northwestern Ecuador until about 1970, when loggers wiped it out. About a dozen trees of the species are known to survive, all at the Río Palenque reserve, which may be too small for long-term stability. Discovery of additional trees on a ridge near Esmeraldas would be important news, except that old habits die hard: the logger intends to harvest all this lumber and sell it, for about $3 a tree, to produce plywood. Incidentally, says Gentry, the stump being used to hold up the RAP team's dinner bench is a new genus.

As Gentry is about to press a flower, Emmons stops by to visit. The atmosphere in this group is one of eager, almost avaricious, swapping of information, with a moderate undercurrent of friction. They are all headstrong, accustomed to working alone, often going from year to year on grants. Emmons and Gentry have worked together intermittently (once in a rich Colombian forest later cut down to make cardboard boxes), and an edgy note of affection and intellectual one-upmanship characterizes their relationship. Gentry has suggested, for example, that a lizard he saw looked like a chameleon because it changed color. "I'm sorry," Emmons snaps, "that doesn't make it a chameleon. Anyone but a botanist would know South America *has* no chameleons."

Now Emmons looks at the flower Gentry is handling, with its eight-inch-long tube leading from the petals to the pocket of nectar at the bottom. "Isn't that the one Darwin looked at and said there had to be a moth with a tongue that long to pollinate it?" she asks. Gentry grins. "And when they found the moth," he says, "they named it *praedicta*." They relish this piece of lore for a moment. Then Gentry says, "It's actually not. The one Darwin saw was a Madagascar orchid, *Angraecum sesquipedale*. And *praedicta* is a [moth] subspecies."

Slip-sliding for plant specimens

Foster heads out one morning on what he describes as a quick tour. He is the least aggressive member of the team, with a habit of muttering small, self-deprecating jokes, followed by a soft titter. His personality, along with the information that he is operating on only a third of a liver due to various tropical diseases, can be dangerously disarming. "See you at the bottom," he says, chuckling as he heads down a landslip where the footing is slick, the angle near-vertical, and the only handholds covered with thorns or rooted so loosely they tear out as he plunges past.

Later, as Foster clambers over the wet rocks of a waterfall with a Santa Claus sack of plant specimens on one shoulder, he speculates about the anomalies of this forest, which he describes unequivocally as the most interesting he has ever seen. It puzzles him, for example, that the forest contains almost no large palm trees, though these trees are abundant just to the east. Wind-dispersed tree species are also absent, and while tree-climbing vines and epiphytes are spectacularly diverse, one expected family of vines is barely represented. Despite a tendency in the public mind to lump all rain forests together, each is distinctly different. This one, says Foster, is "a weird combination" of plants associated with both rich and poor soils.

The botanical puzzle also provides clues to the whereabouts of many animals. An abundance of fig trees may partly explain the noisy flocks of parrots;

Exhausted botanist Al Gentry trudges back to camp loaded down with bags of plant samples after long day in the forest. He completed ten 160-foot transects in five days and found species never before identified.

Parker has spotted four species in a single tree. But mammals are scarce. Emmons' traps have come up empty, and her walks have yielded almost nothing: howler monkeys, an opossum, kinkajous, squirrels, and some tracks of armadillos and pacas. At breakfast and dinner, or when they meet in the woods, the researchers trade half-formed ideas: Does the scarcity of rodents correspond to the lack of wind-dispersed plants, with their edible seeds? Shouldn't the virolas here attract something other than toucans?

"The virolas have this oily, fleshy part around the seed," says Foster. "In Panama, spider monkeys love these things, but they aren't here. Agoutis eat them, too, but there are few agoutis. Have they all been shot? It's hard to believe." Emmons speculates that the long drought may be partly to blame.

Their talk veers from new discoveries and inchoate theories to all the small oddities that make a rain forest so interesting. Parker explains the ability of some wren pairs, once bonded, to sing antiphonal duets (one song with two birds indistinguishably singing alternate notes), but only if they are perched less than 20 inches apart on a branch. John Carr shows off a thumbnail-size frog with a glistening knot of tadpoles on its back. Where other frogs abandon unhatched eggs to float on the water surface (you can see them everywhere in puddles formed by yesterday's footprints), the male of this species apparently tends its eggs in the leaf litter, then carries the tadpoles to water.

A running theme of every conversation is how to save some remnant of this idiosyncratic forest, and of western Ecuador. Emmons urges practicality—trying to persuade the government to protect at least one ridge at Machalilla, if not the entire national park. Parker vacillates between pushing for someone to buy up forested land around Esmeraldas, or simply walking away, to concentrate instead on Machalilla and an ecological reserve to the northeast now threatened by loggers, colonists and a proposed highway.

Ecuador's colonists all over the map

For Parker, the adjustment to Ecuadoran-style deforestation is plainly difficult. He is accustomed to working in Peru, where colonists start at the roadway and spread out systematically on either side. But in Ecuador, settlers are everywhere, leapfrogging two hours into the forest to stake a claim where a road might reach them five years from now. He is accustomed to Bolivia, where the population is smaller and the conservation movement far more effective. In Bolivia, it is possible that the RAP team's discovery of a biological motherlode near the Peruvian border may lead to the creation of a park on the scale of Yellowstone. In two weeks there, Parker found 403 bird spe-

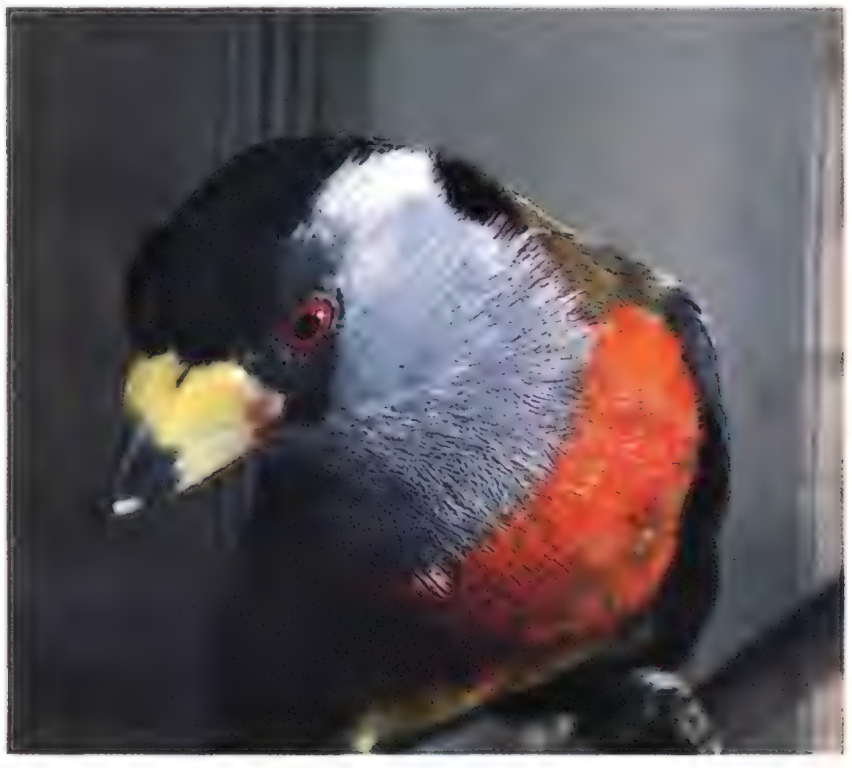
Emmons heads out to check small-mammal traps; she's best known for fearless night-tracking of animals.

Rotting-meat odor of hairy flower (perhaps new species) draws flies, which will carry pollen to another plant.

Exotic grouping of blossoms belongs to a tentatively identified species unknown in Ecuador before this find.

Observes her colleague Ted Parker, "She doesn't think of a jaguar any differently than of a mouse possum."

Added to RAP's list of unknown, unpublished species is a type of *Anolis* lizard, spotted clinging to a twig.



When Parker finally found an extremely rare toucan barbet, it was in a cage in an Ecuadoran village.

cies, and Gentry logged 204 woody plant species in a tenth of a hectare. So when Parker considers the diversity of birds and plants he is seeing now, it seems modest to conjecture that a reserve of about 20,000 hectares would be adequate protection. Foster gently informs him that the area south of Esmeraldas may have only 1,000 hectares of unbroken forest left.

Sometime after the last crested owl has called, but before the rufous motmot begins the dawn chorus, Parker starts his workday, unconsciously filtering out the sounds of raindrops drizzling from leaf to leaf, of monkeys howling, of assorted nonavian creatures whirring, buzzing and croaking. He stands under a faded umbrella, with binoculars around his neck and his microcassette recorder up to his mouth. His sneakers are sunk to their high tops in mud. "Almost everything you hear is ochre-breasted tanagers," he whispers. "It's very difficult to hear because they have such a variety of song, and it's constant." He cranes his head up sharply and says, "*Shhh!*" He stands and seems to do nothing. The intensity of his listening becomes apparent only afterward when one hears what he has murmured hesitantly into his recorder: "Scarlet-rumped cacique . . . and a fasciated antshrike with a pair of barbets singing nearby, probing at a cluster of leaves . . . and feeding on fruit. *Dysithamnus puncticeps* chorus, males and females . . ."

Eerie sound of chain saws in the fog

After a while, Parker points to a broad swath of roadside forest hacked down the day before by a crew of 20 men. "Look at this. This was my best area. I'm trying to think of any place where people work machines all day in the rain without stopping. It was eerie to hear chain saws in the fog."

"Chestnut-backed antbird. I wonder . . . they've had a big part of their territory cleared and they're still singing." It is a plaintive two-note, a voice saying "Come here." "That soft wolf whistle is a barred puffbird." A languid sound, the whistle of a man already lying in another woman's arms. "Here comes a flock of blue-headed parrots, 1-2-3-4-5-6-7-8." He pauses momentarily. "You hear that cricketlike sound? That's a short-tailed pygmy tyrant, one of the smallest passerines. Most people overlook it because it sounds like an insect." He stops at a tree that is dancing with birds, records them, then plays the tape back, enticing them to stay in the area and peek curiously from the foliage. "That sounds like an ochraceous attila," he says. Then his head whips around: "There it goes! *Land!*" It does, and in a few minutes he picks up 30-odd species.

His list for the four days at this site will end up being 195 species long, a healthy total for deep forest; Gentry will log 120 plant species in his transect. From the

entire monthlong trip, the RAP team will conclude that only a fraction of western Ecuador remains forested, that this remnant has both biological and long-term commercial value for Ecuador, and that it is in immediate danger of being decimated. The RAP report will also add to the growing evidence that national parks, which supposedly protect 11 percent of Ecuador, are mere boundaries on the map.

A little after 8 A.M., between the calling of a russet antshrike and the beelike passing of a barb-throat hummingbird, a chain saw starts up. "This land is going to be gone in a few years, and the people of Ecuador are going to have to do something else to survive," Parker says. "Nobody will think about what's lost until 50 years, 100 years from now. The same thing happened in the United States. Why did we cut the Singer Tract in Louisiana, where the last ivory-billed woodpeckers were? It was in the 1940s. We cut it down for railroad ties." He grimaces. "Why not have a few thousand hectares of pure forest preserved? If we suggest this, maybe some Ecuadorans will come forward and start to fight for places like this."

At the end of the logging road, the bulldozer comes clanking and roaring to life. Even in the rain it moves forward 200 or 300 yards a day, and it has arrived now at a massive tree in the middle of an old trail. *Coussapoa villosa* according to Gentry; once a strangler vine, now a tree ten feet across at the buttressed base. It started as a seed dropped here in the top of a tree by a bird. After growing for a time as an epiphyte it sent down aerial roots in search of the earth, and the tendril-like roots gradually twisted together and became a tree themselves, squeezing their host to death. Other plants now grow on it, perhaps two dozen species in all—orchids, spiky bromeliads, ferns, the showy red fruit spike of an anthurium, the broad elephant-ear leaves of a philodendron.

Giant strangler gives way to bulldozer

The bulldozer deftly undercuts the left side of the tree, then moves to the right, where the strangler leans heavily on a tree-size aerial root. The operator's hands move skillfully among the levers, going from forward to reverse, adjusting the angle of the blade, accelerating into the root. It is hard not to admire his ability. He earns about $5 a day, possibly with funeral expenses thrown in if the tree drops on top of him, as it gives every indication of doing. Foster points out that Americans once built a mythology around this sort of thing—pioneers risking their lives to break the earth for their families. It is a vast leap from that mythology to an understanding of its consequences—maybe an impossible leap for people who still aspire to the prosperity North Americans take for granted. Roots crack apart, and after 30 passes the tree shudders and begins to give way. The operator glances up and sees the strangler starting to fall. He throws his bulldozer in reverse, and the fabric of plant life begins to rip apart in front of him. Vines separate, branches split, leaves shower down. The strangler arcs past with a slow whoosh, hitting other trees nearby and dragging them down with it, until the whole canopy seems to come crashing to earth. Light floods into the ensuing silence.

"*Muy grande*," a spectator comments.

The operator reaches one hand up to the open sky. "Look at all the sunlight!" he says. He contemplates his work for a moment with satisfaction. Then he throws the bulldozer into gear again and pushes on into what is left of the rain forest.

Even as the RAP team worked, massive strangler vine (right) was uprooted by a bulldozer to clear the way for a logging road. Worker hacks at root with his machete. A field assistant (below) trudges from main camp along a route that only days before had been mature forest.

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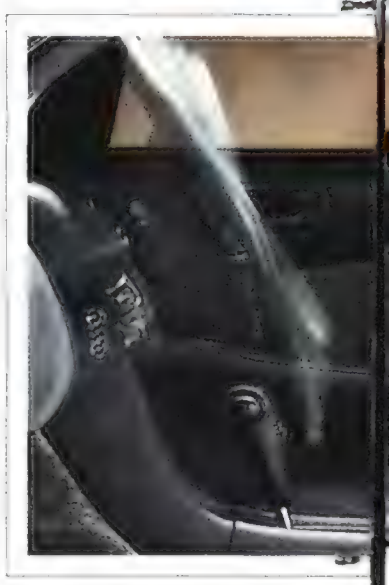

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By Timothy Green

Making scents is more complicated than you'd think

Catchy as the names of perfumes are—Jicky, Samsara, Calèche—so are the names of what goes into them: patchouli, bergamot, ylang-ylang

Quality of oil of just-harvested rose petals is tested by distillation at Rose Institute in Kazanluk, Bulgaria.

Dawn has just broken, but it is a gray, drizzly morning, with mist hanging heavy on the hills. Perfect weather, actually, for thousands of men, women and children already busy on gentle, sloping terraces in the valley below. Wrapped in parkas, shod in boots, they are moving slowly along waist-high hedges of pale pink roses. Working dexterously with both hands, they nip off the blossoms and put them in large plastic sacks. The scent of roses pervades the damp air.

The preservation of that scent is the purpose of this harvest in the Valley of the Roses, near the town of Kazanluk in Bulgaria. For more than two centuries the damask roses grown here have been the world's prime source of attar of roses, or rose oil, one of the most treasured ingredients of the perfumer's craft. It is blended into such fragrances as Joy, Femme and Yves Saint Laurent's Paris. Already perfume makers from France, the United States and Japan have telexed their bids for this year's rose oil, offering up to $2,500 a pound for the top blend.

A moist, cool dawn is essential to the unique aroma, or bouquet, of Kazanluk's roses; it insures a profusion of rose oil in the petals, which would be dried out too quickly by a hot morning sun. "Climate is the dominant factor," explains Spas Kurtev, director of Kazanluk's Research Institute for Roses, Aromatic and Medicinal Plants. Stephen Manheimer, a major importer of raw materials for the perfume industry, considers Bulgarian oil "the standard by which others are measured."

The desire to capture that scent in a bottle has made perfumers seek out Bulgarian rose oil since the early 1700s. The Bulgarians apparently found the secret of steam distillation of rose oil from petals around that time. The oil from their rose gardens was soon exported to France, where the perfume industry was just getting into its stride. The marriage has endured. The international perfume business, whose sales notched up over $10 billion in 1989, still depends on the nimble fingers of those early-rising Bulgarians for a unique floral oil. As a French buyer remarks, "You cannot substitute another rose oil for Bulgarian, it is irreplaceable."

The Valley of the Roses, therefore, is a good starting point on the perfume trail. Not that the history of perfume begins in Bulgaria. The art has flourished from the earliest civilizations, as primitive man often

During brief harvest season near Yasenova, Bulgaria, students from nearby schools are bused to the fields at sunrise to help pick the precious crop. Long glove protects this girl's left arm from lacerating thorns.

Photographs by Michael Freeman

The lasting lure of perfume

"Nose" Jean-Paul Guerlain perfected the company's newest fragrance, Samsara, at laboratory in Chartres.

believed that scent from flowers contained the presence of a nature deity. The first perfumes personified gods or tried to please them with sweet fragrances. The very word "perfume" comes from the Latin *per fumum*, "through smoke," a reminder that it began in burnt offerings, like incense. Perfume's origins are apparent in India and the Middle East, where fragrant plants, such as cinnamon, frankincense, myrrh, jasmine and violets, or fragrant trees, such as orange, lemon and sandalwood, grew in abundance. Fragrance often had a symbolic function in important events in life and death: guests at ceremonies and banquets were sprinkled with fragrant waters, and mummies were impregnated with aromatic substances. Unguent pots in King Tutankhamen's tomb in Egypt, sealed around 1352 B.C., were still fragrant when it was opened in 1922.

Society's frenzy for fragrance

In this millennium the development of perfume in Renaissance Italy and then in France may have had much to do with the need to cover up bad smells, but over time the motive became increasingly focused on sexual attraction. The modern history of perfume, based upon the use of traditional skills to blend those ingredients into a tantalizing aroma, begins in 17th-century France, in Grasse, the hill town west of Nice. By the mid-19th century the court of King Louis XV was dubbed *la cour parfumée*. "Society went into a frenzy over perfume," notes the guide to Grasse's International Museum of Perfumery. "Custom dictated everyone leave a distinct aura in their wake."

The skills acquired have never been lost. Several French perfume houses date back to those heady days. Jean-François Houbigant (1752-1807) set up shop at 19 Rue du Faubourg St.-Honoré in Paris to sell perfume. The company is now located in New Jersey, but its Quelques Fleurs captures all the floral smells of Provence. Roure, a multinational firm that buys raw materials to create and manufacture perfumes for fashion houses or movie stars, was founded in Grasse in 1820 by Claude Roure. The present head, Jean Amic, is the sixth generation of the family to be a creator of perfumes. Guerlain boasts five generations since Pierre François Pascal Guerlain became a perfumer in 1828. The firm still sells a perfume called Jicky, a blend of lavender, sandalwood, lemon, rosemary and rosewood, created in 1889. Its latest, Samsara, was perfected precisely a century later by Jean-Paul Guerlain (left), drawing on skills taught him at age 17 by his grandfather.

The creators of perfume, or "noses" as the trade calls them, are a small clan. Only a dozen or so might merit the reputation of *un grand nez*, "a great nose." A nose must have not only an exceptional olfactory sense but also the ability to retain a memory bank of more

Student at Roure's school for noses in Grasse bones up for an exam, making notes as she sniffs a *mouillette.*

Five decades of aspiring perfumers have gone through rigorous curriculum focused on teaching how to smell.

than 2,000 different scents from which he or she can draw between 100 and 500 to blend into a new perfume. The tricks of the trade are often handed down in the family. "It's easier to teach them early to a son or nephew," confides Guy Robert, the nose behind such fragrances as Calèche and Madame Rochas. He learned them from his uncle, father and grandfather. "It's the little secrets that count," he says. "I've trained several perfumers myself, but I gave the most information to my son because I was able to teach him every day."

But it does not have to be all in the family. Many noses lacking a family background graduate from a training school in Grasse run by Roure. Among them is Akiko Kamei, a sparkling Japanese woman with impeccable French, who started her career as a dietician but found her talents more suited to perfume than food; she helped create a fragrance for Hermès. James Bell, who majored in economics at Fordham, in The Bronx, signed on as a clerk at a nearby Roure plant; he found himself captivated by the smell of his job and headed for Grasse.

Other sybaritic pieces the London-based author has done for these pages include Tutankhamen's treasure, diamonds, jade; his latest book: The Gold Companion.

Noses are likened to artists, composers, even chefs or winemakers, as they blend subtle potions to turn you on. The range of ingredients at the noses' disposal is broad; to obtain it they scour the world. Jean-Paul Guerlain searched India for the choicest sandalwood while concocting Samsara. Guy Robert confides to me that he is experimenting with a lemon tree from the coast of Japan; its aroma is akin to a cocktail of lemon, lime and mandarin.

The basic ingredients produced from natural sources are the essential oils, resinoids (gums or resins purified with a solvent) and absolutes (aromas, in the form of viscous liquids, achieved by extraction with solvents) that are formed within the cells of plant tissues. Barely 2,000 of the 250,000 known species of flowering plants contain the oils. They may be in the entire plant, as with lavender, geranium or rosemary, in the flower, as with jasmine or roses, in the roots of irises, in the fruit of vanilla or in an herb such as anise, in the rind of lemons, oranges and bergamots, in cedar or sandalwood, in the bark of cinnamon, or in lichens such as oakmoss.

The aroma of each essential oil or absolute will vary considerably, not just from one country to another, but within a small region. For instance, the finest oil of bergamot, a pear-shaped citrus, comes from a few

In the Comoros, production is a cottage industry; workers load ylang-ylang blossoms into homemade still.

square miles along the Calabrian coast in southern Italy and is produced by a unique environment of chalky soil, intense sunlight and strong sea air.

Most countries have some particular combination of climate and soil that encourages a certain plant to flourish and win the attention of the perfume trade's raw-material buyers. Go to Guatemala for fine lemon grass, to the Comoros Islands for the spicy flowers of the graceful ylang-ylang tree, to Malaysia or Sumatra for the exotic herb patchouli; go to Finland for pine resins, to Yugoslavia for oakmoss, to China for eucalyptus, to India for ginger and sandalwood, to Madagascar for vanilla. The United States contributes lemons and oranges from California and Florida, peppermint from the Pacific Northwest and clary sage from North Carolina. The bouquet of one year's crop may, as with wine, differ from the next. A trained nose can often distinguish, from a single whiff, the exact place of origin of the oil, perhaps even the "vintage."

The ultimate aromatic, usually attained by pressure, extraction or steam distillation, is a remarkable reduction from the original. The mathematics for jasmine alone are prodigious. It takes 45 minutes to pick 5,000 jasmine flowers, which weigh about a pound; 800 pounds of flowers provide only one pound of jasmine absolute.

Harvesting may be only the beginning. Iris absolute, whose rich and elegant aroma is an essential ingredient of such perfumes as Chanel 19 and Guerlain's Shalimar, is obtained only after the roots, grown mainly in Italy and Morocco, are peeled by hand and dried for 18 months. It commands the top price of any natural perfume ingredient: about $7,000 a pound.

The cost of picking natural ingredients can become prohibitive, especially such tiny flowers as violets, now rarely used. A crisis may arise as Bulgaria makes the transition from Communism, under which the roses of Kazanluk were produced on cooperative farms where pickers received only a nominal wage or were paid in foodstuffs for their animals.

Does that mean a greater swing to synthetic aromas produced in the laboratory? Synthetics are not new. Even in the 18th century early scientific analysis of natural oils led to attempts to isolate an oil's crucial "odorous principle," which produced the vital aroma. The first chemical aromatic was nitrobenzene, prepared from nitric acid and benzene, which was used to give an odor of almonds to scented soaps. The key breakthrough came in 1868 when an Englishman, William Perkin, synthesized coumarin, which captured the new-mown-hay scent of the South American tonka bean. Soon after, Ferdinand Tiemann, of the University of Berlin, produced synthetics of vanilla and violet. And in the United States in 1889, Francis Despard Dodge pioneered citronellol (an alcohol) with a rose or geranium odor, and a variation, citronellal, which could be variously adapted to give the scents of lily of the valley, hyacinth, narcissus and sweet pea.

Even when regurgitated by whales and washed ashore, ambergris is banned in products entering the USA.

The nimble fingers of Italian itinerant workers pluck jasmine blossoms in early morning on Côte d' Azur.

Synthetics offered two advantages. The perfumer was no longer at the mercy of a bad year when the harvest of many flowers might be poor. More important, they widened the range of his palette. With real jasmine oil, for instance, there used to be very few constituents to work with; synthetics increased the range greatly. But they cannot be a complete substitute in high-quality perfumes. "It's like silk against polyester," explains Françoise Marin, Roure perfumer and director of its perfumery school. "You cannot replace the touch of nature."

The touch of nature from animal products, however, has been largely replaced by synthetics as the perfume industry has bowed to pressure from conservationists in recent years. Extracts from the pungent scent glands of the musk, a small deer found in the northern Himalayan regions of Tibet and China; of the civet cat, which is mainly bred in captivity in Ethiopia; of the beaver from Canada and Siberia, were used for centuries. So was ambergris, from the intestines of the sperm whale, an endangered animal protected, with all its products, since 1970 in the United States, and by the Convention on International Trade in Endangered Species since 1977. All these substances helped fix the various essential oils to insure that fragrance remained long after the bottle was opened.

The challenge for the nose is to conjure a subtle combination of perhaps a hundred or more scents from the galaxy at his disposal into a new perfume. "We are dream merchants," says one. Setting to work, a nose is often smartly turned out in a white coat and seated before a U-shaped desk in a laboratory, surrounded by rack upon rack of little vials of *le jus*—"the juice." This set-up is known as the "organ." The musical analogy of an organist before the console is maintained because the composition of a perfume is described in terms of "notes." Notes are the perfumer's code. Each essential oil and each perfume has three notes. *Notes de tête* ("top notes"), composed of volatile aromas, such as lemon or orange, give the initial tang of a perfume when it is opened or put on the skin but vanish swiftly. Next come *notes de coeur* ("central," or "heart notes") from rose, jasmine or iris, which provide the richness and body. Finally, *notes de fond* ("base notes") from sandalwood or cedar, which provide a long-lasting bouquet. In blending, the perfumer may also add "spicy notes," "woody notes," "Oriental notes," "green notes" or "fruity notes." The ultimate blend gives a perfume its distinctive "signature."

The nose begins by dipping narrow strips of blotting paper known as *mouillettes* into the vials and passing them lightly before the nostrils for an initial impression, then attaching them to a rack on the desk to see how the aroma evolves as they dry. Making careful written notes, the perfumer adds and mixes and smells again, drawing on experience of countless previous concoctions—adapting, honing, balancing. At big manufacturers such as Roure, with scores of clients, the

team of noses can draw, too, on "maybe 20,000 fragrances in the [computer] bank," explains Geoffrey Webster, president of Roure's U.S. operations in Teaneck, New Jersey. "So we change a top note here, a woody note there." The final perfume concentrate is not, of course, what you get in the bottle. A high-quality perfume will usually contain from 18 to 25 percent of the concentrate dissolved in alcohol, and a trace of distilled water; an *eau de parfum* may contain 10 to 15 percent; an *eau de cologne*, 5 to 8 percent; and an *eau de toilette*, 2 to 4 percent.

Competition is intense. Perfume houses like Guerlain, Jean Patou or Rochas have their own in-house noses. Fashion houses or movie stars rely on freelance noses or multinationals, such as International Flavours and Fragrances (IFF), Florasynth or Firmenich, that create fragrances on a grand scale, for everything from perfume to shampoo to detergent. Many of the best-sellers are created in these houses. IFF made Beautiful for Estée Lauder and Paris for Yves Saint Laurent; Florasynth dreamed up Giorgio for Fred Hayman, and Firmenich did Anaïs Anaïs for Cacharel.

In 1921 Coco Chanel's nose, Ernest Beaux, presented her with a few numbered bottles. Coco sniffed them; she liked bottle No. 5, so Chanel No. 5 was born. Such classics enjoy a long life. Worth's Je Reviens dates from 1932, Guerlain's Shalimar from 1925, Patou's Joy from 1931.

Yet new perfumes proliferate. Originally perfume houses created and sold perfume. The Paris fashion houses commissioned them, initially as little gifts to clients, but soon as major lines in their own right. So Chanel, Dior and Yves Saint Laurent became as much identified with fragrance as with fashion.

Men's fashion has joined in: witness Calvin Klein's Obsession and Giorgio Armani's Armani. From high fashion it was a short step to enlarge the perfume parade to young fashion and lifestyle, with Colors from Benetton and Guess by Georges Marciano, while Hermès and Gucci added perfumes like Calèche and Gucci No. 1 to their accessories. Jewelers Boucheron, Cartier and Van Cleef & Arpels commissioned their own brands, as did cigar makers Davidoff and Dunhill.

Movie stars and personalities, of course, find the notion of a perfume in their image irresistible, although customers are often less persuaded; many "personality" perfumes sink without a trace.

But there is one star who has really pulled it off. Since 1987, Elizabeth Taylor's Passion has been among the five top-sellers in the United States. It was created for Taylor by Roure, but she followed the waft of virtually every *mouillette*. "She was involved with our perfumers for months to get it right," recalls Roure's

Through the ages, perfume containers have added élan to their contents. Grasse's International Museum of Perfumery has, from the left: extremely rare iridescent Venetian scent bottle, 15th-16th century A.D.; Lubin's svelte opaque glass container for Au Soleil, on which a lizard chases fly, c. 1912; Roman blown-glass bottle—

Geoffrey Webster. They finally agreed on a heady cocktail of ylang-ylang, black currant, gardenia and marigold. Then Taylor went on a nationwide tour, quoting the Shakespeare-like "Bee to the blossom, moth to the flame, each to his passion." People loved it, despite an initial price tag of $165 an ounce. Annual profits of $70 million rolled in. So did the lawsuits. The initial problem was with Paris perfumer Annick Goutal, who just happened to have created a perfume called Passion. No sooner was that settled than Taylor's ex-boyfriend Henry Wynberg claimed a slice of the action, charging that Passion was a copycat version of a perfume he had developed and presented to her in a heart-shaped bottle when they were stepping out together between her two marriages to Richard Burton. The case was all set for trial in Los Angeles last December, with each side having mustered some distinctly unsavory evidence to discredit the other. But a last-minute, out-of-court settlement left the issue moot.

Still, no one has revolutionized the American perfume scene as much as Estée Lauder, a young Hungarian-American who started marketing four pots of skin products in New York in 1946. She created her first perfume, Youth Dew, in 1953, and then seven other best-sellers, such as Estée, Cinnabar and Beautiful, in the ensuing 35 years. She convinced the American woman that perfume could be worn all day, not just on special occasions, starting a trend that has made the United States the world's leading consumer. Out of $10 billion spent worldwide in 1989 (two-thirds on women's fragrances), $3.7 billion is spent here, compared with $4 billion for the whole of Europe, a modest $1.2 billion in Japan and $800 million in international duty-free shops.

Hitting just the right formula, as Taylor did with Passion, is not easy. The first question from a nose is always "What is the concept?" It may be a vague brief, or profile of the prospective consumer, for a "kill me" perfume, for a fresh, floral fragrance or for a zesty, sea-breeze appeal. Some briefs are disarmingly explicit. One specified that the fragrance should "smell like my grandmother's closet." Another, more boldly, demanded "the metallic, leathery smell of a couple who had made love in a Ferrari car."

Saint Laurent's Opium was a trendsetter for the bold, brash perfumes of the past 20 years that sought to capture the spirit of the sexual revolution and the search for the forbidden. As a Paris perfumer put it, "There was a rush to meet the demand of the American woman who wanted a strong, aggressive perfume that said, 'Look guys, I'm here, see me and smell me.' " The trade labeled them "knock 'em dead" fragrances.

it held either oil or ointment, 1st-2d century A.D.; Admiral Nelson's engraved crystal scent flasks, c. 1870, perhaps a gift from Lady Hamilton; René Lalique's frosted flacon, commissioned by François Coty for Ambre Antique, 1907; unique 1825 opaline crystal bird-shaped container highlighted with gold.

Perfumer's art culminates in advertising: a soulful, bejeweled Elizabeth Taylor promoted her Passion, 1987.

But times change. The olfactory trend for the '90s is to less-overpowering perfumes, hinting at floral freshness or the healthy tang of the sea. "Most of the briefs come in now for discreet, feminine, sensual rather than sexy fragrances," says Roure's Anne Cantacuzene. "Scents reflect the cocooning spirit of family. There are lots of natural, healthy 'green notes,' as if we've just mowed the lawn."

Behind the launching of a new perfume is an immense marketing effort—and cost. If perfume is to sell for $150 or more an ounce, it must be packaged around a complete concept. While the nose sniffs *mouillettes*, others huddle on the name, the design of the bottle, a launch party and advertisements to outdo all predecessors. The perfume itself may account for only $5 to $10 of a $150 package. In planning such a coup, secrecy is intense: even the nose probably does not know the name destined for the perfume he is creating.

The rules of the name are that it should be easily remembered, create its own image and, ideally, be universally pronounceable: the simplicity of Paris or Chanel No. 5 is perfect. Tweed conjures an English country aura for the older woman; Safari promises African adventures. The name should also reflect an era. Today, perfumes like Balmain's Vent Vert (Green Breeze) are being relaunched to join the green revolution.

The search for a name often takes more pretentious directions. Guerlain, for instance, sifted 50,000 names before settling on Samsara for its newest fragrance, formulated around the concepts of serenity and harmony. "In Sanskrit, the word *samsara* means 'everlasting return,'" explains Bernard Fornas, who masterminded the launch. "And it's an international name, easily pronounceable by Anglo-Saxons, Latins or Japanese." But is a name "free"? Perfumers habitually register thousands that they might conceivably use one day, often just to block competitors. Even Samsara had been registered in several countries, and it took Guerlain three years to negotiate the rights.

The perfume bottle, too, must match the overall image of its contents. For Samsara's Oriental concept, sculptor Robert Granai came up with a red bottle based on a Tibetan figure in the Guimet Museum in Paris; the yellow bottle cap represents the deep, closed eyes on many Buddhist statues. Bijan's bottle is egg-shaped, echoing nature's most perfect form. Poison, naturally, comes in a sinister little flask, and Panther has black cats leaping out on either side.

A little extra help from marketing men with large checkbooks comes in handy. Flip through almost any magazine, pass through any airport duty-free shop—the images are there. Such hype is costly; budgets have soared. Megamarketing really kicked off with Yves Saint Laurent's Opium. Christian Dior's Poison got about $20 million for its launch; the stake money doubled for C'est la vie and Elizabeth Taylor's Passion. Not to be outdone, Guerlain in 1989 raised the stakes again for Samsara. Says Bernard Fornas, sipping black coffee in his office above the Champs Elysée in Paris, "We all used to launch perfumes discreetly, with very little promotion. For Samsara I've set the level quite high with $50 million."

To get in the mood, Guerlain redecorated the Guimet Museum of Oriental Art in Paris for the initial launch party. In Asia, they flew 300 journalists to Bangkok's Oriental Hotel for a bash. Bernard Fornas and his marketing team made 39 presentations everywhere from New York and Chicago to Tokyo and Yokohama. Saleswomen worldwide were dressed in Tibetan-red uniforms to parcel out the red fans, wrapping paper and shopping bags flaunting the Samsara label. Did it pay? Admits Fornas, "We hope to break even rapidly."

Still, a caution: the customer may be wooed once by an exotic name, a fancy bottle and millions spent on media hype, but will not come back for a second bottle if the perfume itself does not please. As French nose Guy Robert puts it, "In the end, the perfume decides."

A new perfume bottle takes shape, among other Lucite and Plexiglas models, at Ateliers Pierre Dinand.

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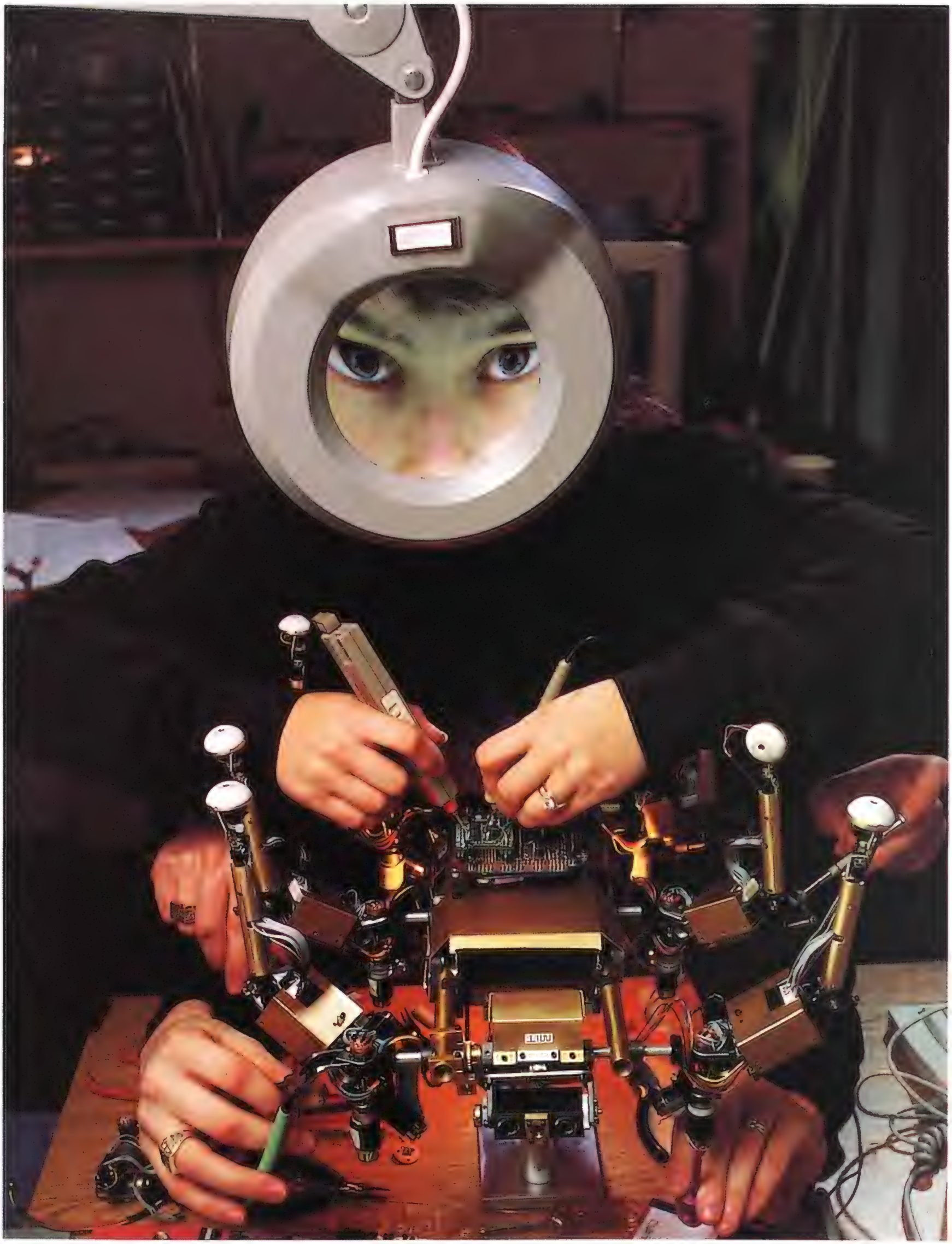

Flat on his electronics-laden back, Attila, the six-legged, arthropodlike robot, submits to hands of computer scientist Cynthia Ferrell and to those of others who had a hand in the creature's creation.

By Richard Wolkomir

Working the bugs out of a new breed of 'insect' robots

While others try to make computers that act like human brains, one Artificial Intelligence lab designs them to behave like ants, bees and flies

Genghis looks dead. He rests on a table in an MIT laboratory, all six legs outstretched. His metal body—a foot long and encrusted with wires and switches—is inert. But Genghis is merely dormant.

Researcher Colin Angle flicks a switch. Genghis straightens his legs and stands up. Eyelike infrared sensors in his "head" take in his surroundings. Pressure-sensitive metal whiskers sticking out front come alive. Genghis scuttles across the table, making an insectlike sound, *thweep . . . thweep.* "His mission in life is to attack—he sits and waits for somebody to walk by, and then he chases them," Angle says.

Genghis' dedication to his mission can be disconcerting. "We had a young woman up here and she asked, 'What happens if he gets the person?' " Angle says. He grabs Genghis just before the robot *thweep-thweep*s over the table's edge. "The only way he actually could get you is if you fell asleep and waved your arms, because he's not fast and he needs the motion of a warm body to see at all."

Genghis, the motion-seeking robot (pp. 72-73), was created by the Mobile Robot Project at the Massachusetts Institute of Technology, which is busily inventing a robot menagerie. So far the creations of the Artificial Insect Lab, as they've come to call it, range from Seymour, who has been known to peddle candy, to a tiny electronic cockroach named Squirt, who mostly hides in the dark, under chairs.

It is not by chance that the lab's researchers give their silicon-and-wire protégés names, as if they were living creatures: it is the lab's self-assigned mission to create robots with behaviors so lifelike they are indistinguishable from the behaviors of real chitin-and-blood arthropods. To do that, they have dreamed up a new way of building robots. While the typical industrial robot might be a backhoe's brother, the lab's creations are small and buglike. And, while most robot designers try to give their creations a degree of artificial intelligence, the Insect Lab's minirobots operate on a far simpler principle.

Genghis has no brain. At least, unlike the average robot, he has no central computer that tries to mimic high levels of human thinking. A conventional robot's electronic brain takes in impressions of the world from sensors and mulls the data—creating an internal model of its environment. It then issues appropriate orders to the motors controlling its legs or other appendages. Genghis does without such a model of his surroundings. Each of Genghis' legs marches to its own silicon-chip drummer, responding to rules, or "behaviors," as simple as, "If I'm a leg, and I'm up, put myself down" or "Avoid obstacles." Yet, from the anarchy emerges coherent behavior: Genghis fixates on anything that moves, and attacks. If a rock is in his path, he steps over it. Plop a barrier in front of his "face" and he walks around it. A tiny microprocessor takes the place of a central computer, so Genghis is, almost literally, flea-brained. Still, he may sire an intellectual revolution.

Genghis and his electronic cousins in the Insect Lab's growing zoo could lead to new ways of exploring other planets, at a fraction of projected costs. Similarly, the buglike automata crawling out of the lab could change everything from surgery to house cleaning. Insect Lab robots are one manifestation of a new research field called Artificial Life, a name suggesting that computers may ultimately add to our understanding of life itself.

Job-hunting in the real world

Artificial Life (AL) attempts to simulate biological forms within a computer, much as Artificial Intelligence (AI) seeks to design computers that seem to do what our brains can do. AL experiments range from creating digital "ant colonies" to writing simple computer programs that compete and copy themselves inside a supercomputer, and "evolve" into advanced programs according to Darwinian rules. MIT's Insect Lab, however, takes a different route: its researchers put artificial life into a metal body and let it loose in the real world to see if it can do useful work.

The Insect Lab began just six years ago, when Australian computer scientist Rodney Brooks joined the MIT Artificial Intelligence Laboratory, where the Insect Lab is housed. "I was a total nerd my whole

Photographs by Peter Menzel

All bug-eyed over robots at MIT

A victim of complex design, soda-can remover Herbert, whose arm works for the camera, failed on the job.

childhood," says Brooks. "I've been building computers and robots as far back as I can remember, starting at our family's house in Adelaide."

Brooks, tieless, wearing Reebok running shoes, presides over a laboratory that might be a TV repair shop, jammed with computer monitors, wires coiled like snakes, boxes of circuits, and shelves lined with vises, graphite-lubricant spray cans, tweezers, screwdrivers, hack saws and high-intensity bulbs. His office wall features a Moroccan copper plate and an upside-down world map captioned "Australia—no longer down under." Equations scribbled on a whiteboard are headed "Sequence of Motor Actions." Chunks of coral and ore lie on his desk. Taped to the door is a photograph of Brooks looking pensive, captioned "What is this man thinking?" Underneath is the answer: "I wonder what they'll think I'm thinking?"

"I was appalled by existing robots," Brooks says. "They'd take a picture, sit there computing for 15 minutes, move one meter, then start computing again." A thought came to him in November 1983, as he was about to give a talk at a major California think tank. "The logic people were meeting with the vision people about how to get from visual data provided by a robot's sensors to a mathematically logical description of the world," says Brooks. "I went into the meeting and said, 'You're wrong—you're asking the wrong question!' "

The right question was, What about beetles? And aphids? Brooks decided to build robots with no overall perception of the world. Instead of Artificial Intelligence, he would copy the simpler forms of natural intelligence that work well for arthropods. Bugs have very restricted mental abilities, yet they earn a Darwinian A+ for survival. Humans may one day colonize Mars, but cockroaches have already colonized us.

Learn to crawl before you learn to think

"Insects don't have many neurons—there's not much computation going on in there," says Brooks. "A bee must have a lot less computation power than a supercomputer," he adds. "With our sophisticated computers, we should be able to mimic the bee's complex behavior, but we don't know how."

Brooks' cogitations on insect neurology led to new ideas for wiring robots. "It seemed to me we should follow evolution—animals get smarter by adding layers, not by suddenly developing a cognitive box," he says. In other words, learn to crawl before you learn to think. Brooks decided that Artificial Intelligence researchers, by starting at evolution's peak—human thinking—are working backward. Also, AI programs operate in stripped-down artificial worlds inside computers, free of the real world's complexity. Brooks thought that was a dead end. His robots would test

Eyeball to eyeball with his cocreator Rodney Brooks, Genghis explores the lab's lunarlike "sandbox," where legged robots traverse rugged terrain, maneuvering around rocks, climbing hills and avoiding holes.

their mettle (and their metal, too) against the real world, which is chaotic and forever changing. Insects do it. The task was to make a robot behave more like a house fly or a bee.

Brooks' first try was Allen, who resembles a perky vacuum cleaner, something like *Star Wars*' R2D2, only without a skin, so that his innards are visible. Allen is no intellectual. His only trick is to follow walls and go through doorways. His electronic hardware is much like that of conventional robots. For one thing, at that time Brooks still thought a robot needed lots of brainpower, and so an umbilical cord connects Allen to a full-size computer. Brooks' first lesson was that his simpler approach required less computer power, and Allen's central computer proved quite unnecessary.

Circling Allen's brow are sonar sensors like those used on Polaroid cameras. The robot emits ultrasonic pulses, like a bat, then listens for echoes to gauge the distance to obstacles. Signals from the sensors trigger behaviors, such as an obstacle-avoidance reaction that steers the robot away from any nearby object or person.

Since Allen, the lab's robots have been acting smarter. Yet, they work with much less computing power, carrying their own circuits onboard and operating autonomously. And they run on simple stimulus-response reactions—instincts. "For example, I built a robot that looks like a mini jeep with big mag wheels," says my guide, Colin Angle. The robot's name is Tooth. In front, it has a pincer with two bumper sensors. If they touch something, they turn on. For "eyes," the robot has two infrared sensors.

To avoid obstacles, Tooth follows rudimentary rules: "If infrared sensor No. 1 fires, turn left; if infrared sensor No. 2 fires, turn right." Following such "instincts," the little robot runs along a wall. "The robot doesn't need a model of the wall," says Angle. "If it hits the wall, the pincer's bumper sensors fire—that means, 'Back up, turn away and go on.'" He made Tooth for "nickels and dimes"—about $500—two years ago at NASA's Jet Propulsion Laboratory. Tooth proved to be a real eye-opener to the researchers at JPL because of its simplicity and small size. "It'll wander around a room for hours, until its batteries die, and it rarely gets stuck," says Angle. Simple and brainless as it is, Tooth has about 20 different behaviors.

All of the lab's mechanical bugs now run on such simple stimulus-response rules, which are organized in layers, with higher rules authorized to cancel out

Richard Wolkomir reported on ancient Americans in the March issue, jigsaw puzzles in May 1990 and movie high-tech special effects in October 1990.

A glass pane separates undergraduate Chris Foley from his wall-climbing, suction-footed robot, Eddie.

lower rules in certain circumstances. A lower rule may say "Roll straight ahead," but a higher rule—"If the left infrared sensor detects an obstacle, turn right"—can override it. Each robot is like a beehive, in which each bee follows its own instincts. Nobody is doing much thinking. Yet, as an overall unit, the colony acts as if it were purposeful and intelligent.

Colin Angle shows me Herbert, the lab's second robot (p. 66). Herbert's task was to roll through the lab at night, collecting soda cans with his gripper. Unfortunately Herbert managed to find only one soda can in his brief career, although the lab still shows him off to visitors. One set of infrared sensors circles the robot on top, and a second set circles it around the bottom. They detect obstacles. To gauge distances, Herbert was supposed to shoot out a laser beam to hunt for soda cans, seeking two rising parallel edges with a flat top. Yet Herbert has no central brain. He has 24 separate circuit boards, each about the size of a playing card, each controlling one discrete behavior. Herbert's success in life was to teach his creators a sound lesson: while individual systems may work beautifully on their own, putting them together doesn't always work so well.

Seymour is the lab's capitalist because from time to time he is equipped with a candy-vending machine. His initial design as a knee-high testing machine for vision (See-more) has him outfitted with a set of video cameras. With the help of infrared sensors he can track down a person and offer candy. Colin Angle explains: "You want to give the robot a fun task, to get yourself thinking about real-world problems." Seymour's video cameras can determine the size and shape of a room or follow a moving blob.

In five years, the lab's robots have multiplied. There are Tom and Jerry, two toy-store trucks that researchers gutted and fitted with circuits. Toto, another R2D2 look-alike, has sonar "eyes" sufficiently sharp to note landmarks as he travels, so that he can find his way in unknown territory. Two-footed Eddie (left) climbs walls, thanks to vacuum-driven suction pads. The lab's most boorish robot, Hoser, carries an onboard water gun and looks for people. He has only three basic behaviors: "Wander, locate, shoot."

Hoser moves on wheels. So do many of the other robots. But they are missionless machines, merely test beds for design ideas. If they were working robots, their wheels might be a handicap, especially in rough terrain. And Insect Lab robots are evolving toward just such an assignment—as planetary explorers.

At the lab's center is the "sandbox." It is a glass-walled room with a gravel floor. Inside, robots can test their skills for exploring the Moon or Mars by maneuvering around rocks, climbing hills and avoiding holes. For such missions, the Insect Lab researchers believe the best propulsion system is legs. And so they built Genghis, the six-legged mechanical ant.

"One thing we learned from Genghis is that legs make good sensors," says cocreator Colin Angle; "you can put your foot down and test the soil, to see if it'll support your weight." He explains that devices mounted on a robot leg can measure the force exerted by each step. That gives the robot data on the terrain underfoot. To exploit such ideas, Angle has developed a more sophisticated robot, Attila (p. 64).

Electronics-encrusted Attila is way cool

Angle is "an electrical engineer, but half mechanical, because to build a system that's integrated, you need an integrated outlook." Modern folklore would have such a researcher wearing thick glasses and avoiding all muscular exertion beyond tapping computer keys, but Angle was a high school wrestler. He began building robots in his childhood. "My intent was to major in whatever would let me build the coolest things," he says. And his robot Attila, 14 inches long, with the six-legged, electronics-encrusted, antenna-waving look that George Lucas might dream up for some extragalactic epic, is way cool.

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A wheeled robot needs information about the entire strip of terrain over which it must roll. "But a walking robot needs information only about a few points, where its feet will touch down," Angle says. To get that data, Attila has 150 individual sensors of 12 separate types. For example, a down-looking infrared sensor lets him "see" what he is about to step on. Pressure sensors on his legs provide more terrain data. "Some things, like blades of grass, are squishy and don't press back much," says Angle. "NASA calls them 'nongeometric hazards,' like quicksand." Attila peers ahead through forward-looking infrared sensors. He gauges whether an obstacle is too big to step over. He also has color sensors. "Attila might be in an unknown terrain and learn that dark-and-brown means mushy, so don't step there," says Angle. The robot also waves a metal whisker that "feels" obstacles ahead, such as rocks.

Attila would function as an explorer, transmitting images and other data to headquarters. His edge over the conventional robots with which he is competing for a slot on a Mars mission is that he is small and cheap. By contrast, Carnegie Mellon University, in Pittsburgh, is developing a 12-to-18-foot-tall planetary rover that weighs from 5,000 to 7,000 pounds. "To send a one-ton rover, it would cost about $14 billion, but we could send a robot like Attila and save billions," says Angle.

In fact, Attila is so small and cheap that NASA could send 20 Attilas. "You'd get better coverage and you could send them to dangerous places that are more interesting; if you lose a few, so what?" Angle says. "We can put in behavior to try to unjam a leg caught in a fissure, an advantage of these small, cheap robots." Headquarters, perhaps back on Earth, could send commands to the robot, such as "Check out the area to the right." Angle adds, "Meanwhile, he's in charge of saving himself from killing himself."

Tiny, cubic-inch (and then some) Squirt seeks darkness; his makers wanted to see how small a robot could be.

Another Insect Lab researcher, computer scientist Maja Mataric, is developing a different sort of space robot. "I'm working on a group of 20 robots that we'll set into an environment and let go," she says. Dubbed the "Nerd Herd," the robot squad will help develop sites for lunar colonization. Mataric began by asking entomologists about ants. They told her that each ant runs on a simple rule: "If I smell that, I do this." Yet the ants work together cooperatively. These robots look like kids' toy construction machines. "Originally, they were going to be 20 bulldozers, but they couldn't build interesting things because of their scoops—robots with grippers will be more interesting," says Mataric.

She grew up in Yugoslavia, keen on art. "But the mind fascinated me, so I took psychology and physiology for fun," Mataric says. She combines all her interests in the making of robots: "The art is in designing the creature, because it's like playing God—you can make your robot any way you want."

Putting a herd of nerds on the Moon

The Insect Lab is pushing a wild plan: a rocket will land a Nerd Herd on the site of a future lunar colony—before humans go. With their scoops reattached, the robots will dig trenches for habitation modules, then pile up soil to shovel on top of the installed modules as a radiation shield. They will follow simple behaviorial rules, pausing periodically to sun themselves and recharge their batteries. When human colonists finally arrive, the robots will have the site ready.

"They can sort, build, tear things down and push each other out of bad situations," says Mataric. "One guy will say, 'I'm stuck,' and the other guys will say, 'I move toward emergency.' When they get in range, they will say, 'I push.' "

The robots will learn as they work. "Every time one goes to a spot where other robots are in its way and it can't pick up anything, it'll be unhappy, so it'll gradually learn to go to less-crowded spots," Mataric explains. The robots will operate on hierarchies of "instinctual" behaviors. "I can't run into anything" might be one instinct; "I really like blocks" might be another. But the lower instinct would be superceded by a higher one: "If I'm hungry, I have to forget blocks and go sun myself." Mataric says, "They all want to build things, so together they build columns and walls, without explicitly trying to cooperate."

The Nerd Herd robots are only one foot long. However, by the standards the Insect Lab has set for itself they are grotesquely huge, cumbersome and expensive, at about $2,500 apiece. The researchers have become

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transfixed by the idea of producing, for nickels, thousands upon thousands of robots the size of gnats. Naturally they are called gnat robots.

To see just how small a robot might be if it were assembled from currently available parts, the Insect Lab made Squirt, a one-cubic-inch (and then some) "cockroach" who scoots under chairs and into other dark places, hiding until it hears a handclap. After things have quieted, Squirt (p. 70) ventures out to investigate. "It's still too big," says electrical engineer Stephen Bart, who works on the gnat robot project.

Anita Flynn, an Insect Lab scientist, agrees. "What we really want to do is to make a computer chip get up and walk." She likes to dream up possible jobs for such tiny, cheap, throwaway robots. A gnat could crawl along an underground electrical cable until it finds a break, bridges the gap and stays there as a permanent repair, she suggests. They may get in our hair, too, she says: "Imagine never having to mousse your hair because you have hundreds of gnat robots that live on your scalp and give you autonomous hairdos."

Insect Lab goals seem quite practical, aimed at Mars and the Moon. But the lab's research is basic, too. Computer scientist Ian Horswill, for example, studies perception and likes to play around with strange devices like his "relaxation glasses," which play a pattern of lights on the lenses (right). "I've found that if you have an actual problem in the actual world with an actual robot, it makes things easier," says Horswill. But one of his current interests is house flies.

As a fly flies, he says, it seems to the insect as if it stands still and the world moves past it, creating patterns on its retinas. "There's hardware in the fly that picks that out and feeds directly to the wings for course corrections," Horswill says. As a fly approaches a wall, an internal "looming detector" notes the telltale pattern of diverging lines. That signals the fly to flip backward, presenting its legs to the wall. "Flies weigh so little they land by just crashing," he says. "It may be that one circuit fires when something touches the feet, which signals the wings to stop working." Pressure on the fly's feet inactivates its wings. "To take off, it jumps, so that nothing is touching its feet, and that starts its wings," says Horswill.

"Humans do some of the same sorts of things, such as flinching," he says. "It's cross-cultural—scare a Yanomami Indian with a plastic spider and he flinches just as we do, so it would seem that a lot of our activity is hard-wired." Horswill is trying to reproduce such behavior in an artificial life form. Specifically, he is developing a robot "tour guide." "It will live here in the lab and activate if someone walks up and stares at it, as visitors are likely to do—and graduate students, who are sick of it, are unlikely to do," says Horswill. The robot offers you a tour. If you nod, it leads you through the lab from point to point, spieling away. "I'm trying to decide what seeing and perception are," he says.

Investing a machine with the perceptions of a fly is one aspect of Artificial Life research. Other AL studies range from onscreen, simulated ant colonies created by

Turned turtle, Genghis displays his innards, echoed in the circuitry of Ian Horswill's "relaxation glasses."

Mitchel Resnick at MIT's Media Lab to efforts by Danny Hillis, cofounder of the supercomputer firm Thinking Machines Corporation, to "evolve" computer programs using the Darwinian principles of natural selection. Hillis' computer generates thousands of rudimentary programs that compete, "mate," pass on digital "DNA" and evolve into more-sophisticated programs. "AL aims to explain how animals behave and evolve," says Resnick. "Rather than observing animals, AL researchers try to create artificial animals—they think the way to understand life is to build it."

In 1985, Rodney Brooks' first MIT lab was a small room he shared with a compressor. He was alone one night in the empty building, working on a computer as he struggled to animate his first robot, Allen. "I hit the return key and it was like—Yow!—he moved!" says Brooks. It was a Dr. Frankenstein moment, perhaps. But it was a Neil Armstrong moment, too—one small step in the exploration of a new world. Brooks says, "The feeling was sheer joy."

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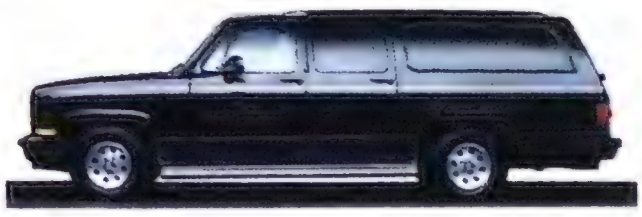

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By Robert Wernick

Bewigged, bothered and beleaguered, the barristers of London carry on

The Inns of Court are headquarters to an antique legal system whose practitioners are now embroiled in Britain's 'Bar Wars'

"And did not your own mother say that when she heard of what you had done to your brother she thought she would faint dead away?"

"I did nothing illegal," said the sullen defendant.

It was my first visit to the Victorian-Gothic caverns of London's Law Courts, and up to this point it might have been a scene being acted out in any courtroom in the world. The judge and the lawyers wore white wigs turned gray in service and somber black gowns, but the case they were conducting was a case like any other, a sordid squabble over a bit of financial skulduggery in Yorkshire.

With the next question by counsel for the plaintiff, it became uniquely English.

"And did not your closest business associate say that when he was informed of what you had done to your brother, he felt, to use his own expression, gobsmacked."

"I did nothing illegal," repeated the defendant. But his counsel, paying no attention to him, was already on his feet. "I believe," he said, "that my learned friend will find that the term used on this occasion was more likely to have been 'gobstruck.' "

The judge, who had been impassively taking notes, leaned forward now, his face crinkling with curiosity. " 'Gobstruck,' " he said, testing each syllable on his tongue, "what a curious expression. Would it be American?"

"I submit with great respect to your Lordship," said counsel for the defendant, "that its origin is more likely to be found in the north of England."

"I suggest to my learned friend," suggested counsel for the plaintiff, "that it may rather derive from Ireland."

And for the next few minutes the bitter brothers from Yorkshire were quite forgotten, and we might imagine ourselves transported from the stuffy courtroom to the dowdy comfort of the common room in an ancient college where three learned gentlemen in black gowns were chattering wittily about etymology.

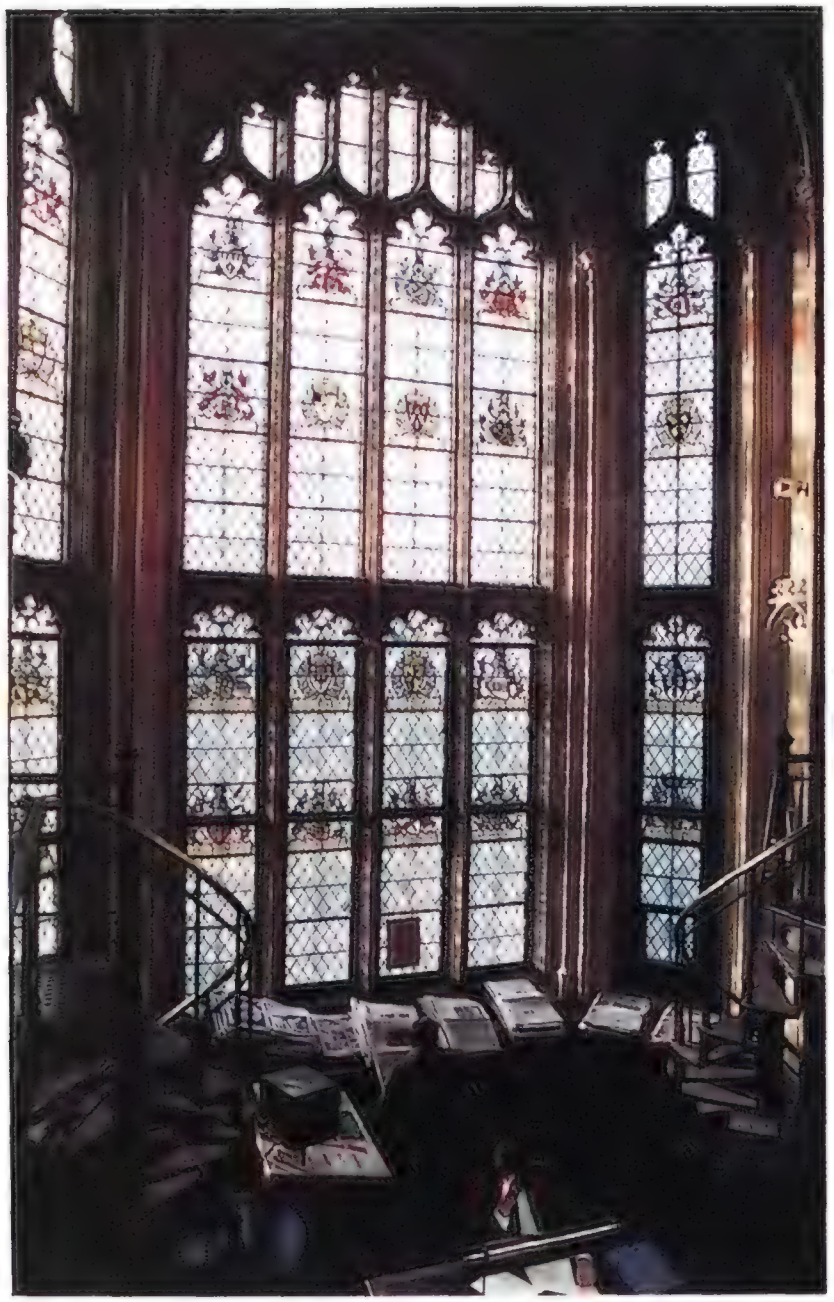
Then it stopped as abruptly as it had started, and we were back racing through the testimony of the defendant.

"Racing" is a word that comes automatically to mind, at least to the mind of any foreigner who attends an English trial. The law's delays have been proverbial in England since at least Prince Hamlet's day, but they can often be laid at the door of the solicitors, the lawyers who prepare the case in Britain's higher courts. Once it comes to the courtroom, the trial is the domain of barristers, and they usually proceed with verve and skill and dispatch. The reason is simple: almost everything in an English civil trial is oral. Perhaps this reflects a national trait—"We English," as one bland barrister puts it, "would rather listen and talk than read and think." At all events, there is little sign of the mountains of paper that precede, accompany and follow American trials. Far more is done by word of mouth—opening statements, examination of witnesses, closing statements. In most cases, the moment the lawyers have stopped talking the judge starts to utter, not read, his decision. If the losing side is dissatisfied, it can take the case to a court of appeal, which is perfectly capable of listening to oral arguments and settling the matter with an oral decision.

Clearly it must take special training as well as special talents to make a system like this work satisfactorily; it can hardly be improvised. There is a rumor that one brilliant trial judge in New York began to imitate the

Legal memorabilia include barrister's wig, documents dating to 1805 and seals—black one is the Crown's.

Photographs by Bryan and Cherry Alexander



Library at Lincoln's Inn has modern computer system and a collection of legal texts begun 500 years ago.

English style of giving immediate judgment, but he was warned off it by the appellate court for fear that other judges would try it too and make utter fools of themselves.

Though it has been under violent attack at home in recent years, the British legal system has always enjoyed enormous prestige abroad. It relies on rules of conduct that have been refined slowly over 700 years, and it works. Barristers must have every detail of the case at their fingertips. They have to be able to think quickly on their feet. They have to be masters of wordplay. The judge has to be able to keep a running rational summary in his mind of all the complexities of fact and law filling the air in front of his bench. Lawyers and judges alike have to understand the nuances of the language they speak so that they can dispose of matters like the credibility of evidence with a few words, sometimes an unspoken nod. They can do it so smoothly because they are all, in effect, members of one great cozy club. In the higher court system of England and Wales, where all serious crimes are judged, and all civil suits involving more than £5,000 (soon to be £25,000), all trial lawyers and judges are required to be barristers, that is, they must have been "called to the Bar." There is, and for the past 400 years has been, only one way to be called to the Bar, and that is to join an Inn of Court. There are four of these Inns, all in Central London: Inner Temple, Middle Temple, Lincoln's Inn and Gray's Inn, each jealous of its separate traditions but all with a common view of the duties and prerogatives of the Bar.

In the old days the Inns provided all the legal instruction necessary, not in formal classes but by continual contact between students and their learned elders, mostly in the great communal dining rooms, listening and talking about cases and precedents while the claret and the port went round. A student who was judged to have soaked up enough learning after a few years was summoned to step up to the Bar, which was originally a wooden barrier marking off the part of the hall

The author never thought of going to law school, but was once caught up in the toils of the law, during a suit over some book royalties. He won.

Clad for business in wig and gown, barrister strides toward the Law Courts, where trials begin at 10 A.M.

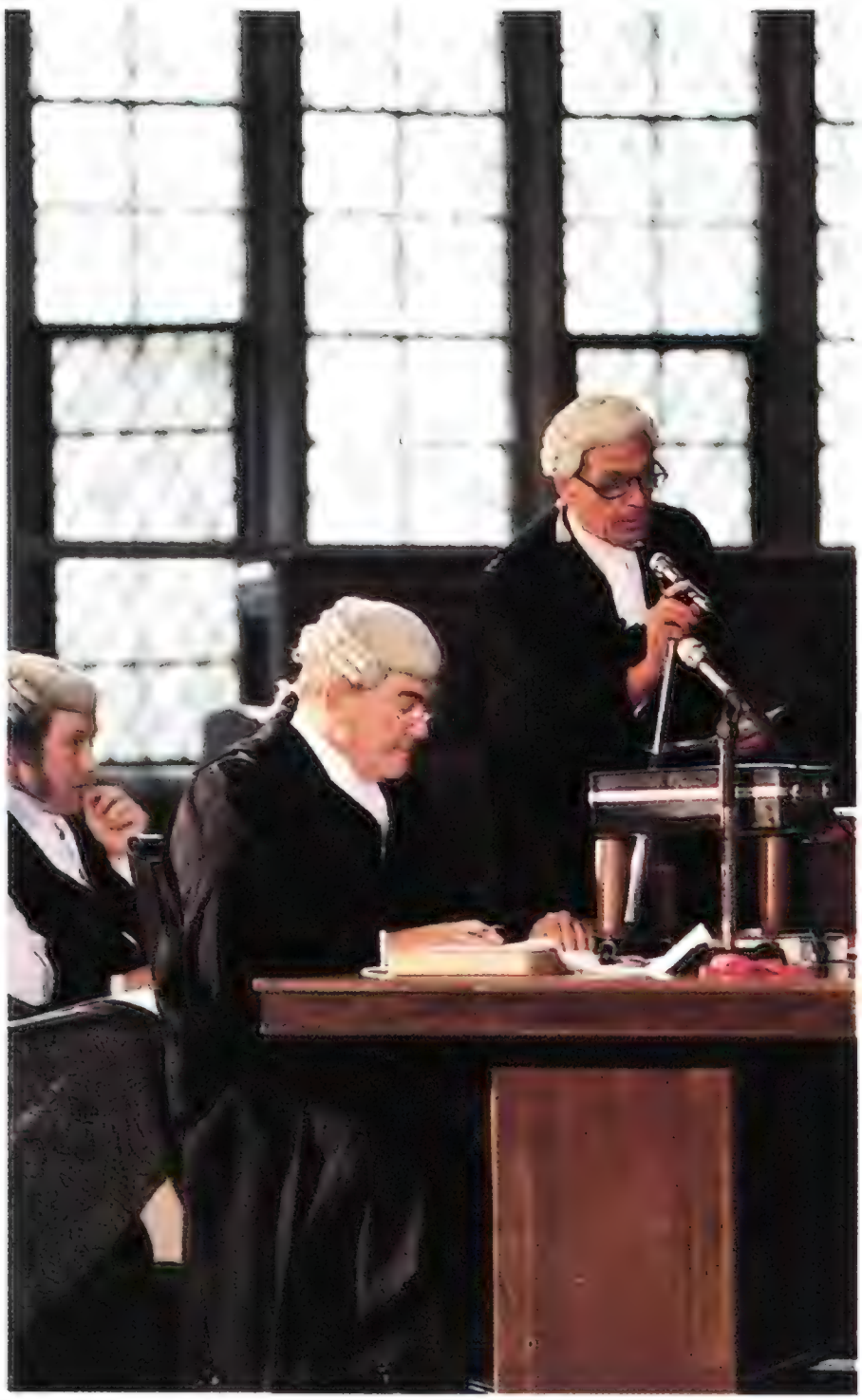
Statue inscribed "Lawyers I suppose, were children once" livens up green courtyard of Inner Temple.

reserved for the exclusive use of "the benchers," or senior members of the Inn. From that moment on, the candidate was authorized to practice before the higher courts of England and Wales.

Modern bureaucratic times have changed the kindly old rules, and today the student has to take regular courses in torts and evidence and pass official examinations. But you still cannot become a barrister without having taken at least 24 meals over a two-year period at your Inn. In practice, everyone takes more meals than that, both because they are cheap and because they provide a way of slipping painlessly into the community of the Bar. Aspiring barristers once formed a tightly knit group of young men from upper-class families who had gone to Oxford or Cambridge. Today, a liberal scholarship policy insures that they will come from all up and down the social scale and from all kinds of Redbrick universities. And almost a third of them are women. No matter. By the time they have been through an Inn of Court they all speak with the same snuffling, snorting Oxonian drone, they have all adapted themselves to the tone of the English courtroom, which an American judge, Benjamin Kaplan, has defined as "informality within a formal setting."

Physically speaking, the Inns are four big clusters of buildings, covering some 15 acres of choice land north of the Thames on both sides of Fleet Street where it meets the Strand. Lawyers are said to have begun congregating there in the 14th century, renting some quarters for £10 a year in buildings that had belonged to the Order of the Knights Templars before it was dissolved by King Edward II. It was a shrewd choice, for it lay halfway between the center of financial power in the City and the center of political power in Westminster. Medieval London was subject to periodic assaults by rebels such as Jack Cade, who led a mob into town in 1450 shouting nasty things like "Death to all lawyers!" The canny lawyers laid low, though at times this meant more than just rising above the epithets. In one incident, they had to watch as the deeds and records of the Temple buildings went up in smoke. They went on squatting there, and by the next century, in the time of the Tudors, they had come to be recognized as legal owners of both the Inner and Middle Temples.

Antony Scrivener, this year's chairman of the Bar Council, works in cluttered chambers at Lincoln's Inn.



In playful mock trial at Lincoln's Inn, barristers re-argue an 1889 case about an American murderess.

Gradually they organized themselves as corporate entities, self-governing and self-supporting and eventually very rich. Gradually, too, they gathered unto themselves the monopoly of preparing young hopefuls for the Bar. All the great judges and advocates and legal philosophers who have created the extraordinary fabric of the English law passed through the Inns. So did many others whose names shine brightly in the political and cultural life of the nation. Sir Thomas More and Sir Francis Drake and Sir Walter Raleigh and Shakespeare's Sir John Falstaff, Sir Francis Bacon and John Donne, Sir William Blackstone and William Penn and William Pitt, Boswell and Fielding and Sheridan and De Quincey and Lamb and Thackeray and Macaulay, King Edward VII, Margaret Thatcher and, of course, Rumpole of the Bailey all took their meals at an Inn of Court. So did five signers of the American Declaration of Independence; Mohandas K. Gandhi (disbarred in 1922 after being convicted of sedition in India but formally reinstated in the rolls of the Inner Temple in 1988); as well as the founding fathers of several new African states.

Walled off from the roaring traffic of the Embankment and Fleet Street and High Holborn, each Inn is a self-centered community with its own gardens, lush with cherry and magnolia, camelia and crocus; its own library; its own dining hall; its labyrinth of walks and lawns; its blocks of offices and flats let out mostly to barristers. Tourists still line up to see the rooms where Dr. Johnson lived and pontificated two centuries ago.

The English have always believed, with some reason, that their institutions are quite unlike those of other

nations. They were not created, like those of the Russians, by the ukase of autocrats, or like those of the French, by unbridled human reason. They have grown slowly, haphazardly, absentmindedly but shrewdly. The rolling English drunkard, boasted Chesterton, made the rolling English road. Just so with the Inns of Court, which are the product of uncoordinated but surprisingly harmonious growth over the centuries. Certainly no sober man, starting from scratch, could have come up with anything resembling the jury system, which entrusts decisions in all criminal cases in the higher courts to 12 citizens chosen specifically because they know nothing about the matter in hand. Yet the world recognizes it as one of the glories of England, and of the United States and other countries that have borrowed it from England.

Sometimes the roll becomes a lurch, and the system has to correct itself. The Lord Chancellor's Court (Chancery) was created to provide a quicker, fairer way through the tangle of precedents and technicalities that were delaying justice in other courts. By the 19th century it had itself become so encrusted with its own technicalities, so afflicted with monstrous delays, that Dickens could write in *Bleak House* that it "exhausts finances, patience, courage, hope, overthrows the brain and breaks the heart." Toward the end of the century it was abolished as an independent entity and absorbed into the regular court system, where it functions at the same speed as any other.

Crusader effigies; clicking computers

Antiquity is here in the Temple Church with its effigies of Crusaders lying stiffly on their tombs, and next door computers are clicking away in the more up-to-date offices. The hammer-beams of the roof in the dining hall of the Middle Temple looked down on the first performance of Shakespeare's *Twelfth Night* in February 1602. When the producers wanted an authentic 18th-century background for the movie version of Henry Fielding's *Tom Jones*, they simply cleared the cars out of King's Bench Walk in the Inner Temple so Squire Western and his friends driving up in their carriages could feel completely at home.

The horsehair wigs that barristers wear date back only to the 1840s, when they replaced the old model made of human hair, which had to be periodically recurled. It is now a rite of passage for the fledgling barrister to have his or her skull measured at Ede & Ravenscroft on Chancery Lane for the wig that will stay in place for a lifetime of courtroom oratory. (Lawyers on this side of the Atlantic might still be wearing them had not Thomas Jefferson written to John Jay, our first Chief Justice, that they made English lawyers look like "rats peeping through bunches of oakum.")

Cavernous, gothic Royal Courts of Justice has 1,000 rooms, and three and a half miles of corridors.

In Gray's Inn Hall, backed by pictures of famous jurists, members and guests enjoy Grand Day Dinner.

On the other hand, the tradition that the benchers of Lincoln's Inn may drink the sovereign's health without rising to their feet goes all the way back to 1660 when they were joyously welcoming King Charles II home from his travels, with such joy and on such unsteady legs that the gracious monarch told them, "Gentlemen, you may sit."

"Gentlemen," he called them, for barristers have always been just that. In the rigid class structure of old England, being called to the Bar was one of the few ways an ambitious young man from the lower orders could rise quickly and safely up the social ladder. In 1880 a father wrote to his son who was pondering a choice of careers that, while he would not oppose his turning to mercantile pursuits if he insisted, "it would be a great comfort to me, and to those who love you, that the career of a gentleman is within your reach." The young man went on to become Sir Edward Marshall Hall, the most successful and flamboyant of trial lawyers in the early 20th century.

One of the peculiarities of the English higher court system is its division of lawyers into the two classes of barristers and solicitors, with the former arguing the cases and the latter doing nearly everything else. There has never been any doubt, though, as to which outranks the other. The time has passed when solicitors had to use the tradesmen's entrance while barristers could walk in the front door. Young barristers are no longer given a manual of conduct warning them against the consequences of too much social intercourse with solicitors' clerks. But a touch of the old distinctions lingers on. A barrister almost never sets foot in a solicitor's office; it is usually the solicitor who brings his client around to the barrister's chambers. The solicitor negotiates and collects a fee like any other businessman, while the barrister would be made acutely uncomfortable by the mere mention of cash payment. He still bears in his gown a symbolic fold forming a little pouch in which grateful clients once slipped pieces of gold as honoraria that would not sully his hands. He does of course get paid, but all that side of things is handled by his clerk.

In the higher courts, the solicitor does the background and the paperwork. He prepares the case, tracks down and examines witnesses, collects and weighs the facts, and "briefs," or hires, a barrister who he believes can handle the case properly. Today there are about 6,500 barristers in England, compared with 45,000 solicitors. Barristers live in a different world; they are members of a small caste whose closest approximations are the samurai of old Japan. Like the samurai, a barrister has been exhaustively trained for one thing and one thing only, to fight for hire. His main function is to appear in court for his client. He is handed the necessary facts by the solicitor. He does not see witnesses till they take the stand. In many criminal cases, he does not even see his client till the day the trial starts.

Solicitors generally form partnerships. The barrister

In October procession marking start of legal year, top barristers in long wigs stroll toward Parliament for the Lord Chancellor's Breakfast.

The Lord Chancellor, in ornate robe, leads colleagues.

is a lone gun, an independent operator. He does team up with others to form what are called chambers, usually but not invariably with offices in an Inn of Court. The members split expenses and the services of a clerk, but they can conceivably find themselves on opposite sides of the same case. For barristers, by long custom, operate on what is called the cab-rank rule, which means they must take whatever case is offered them. Of course, as one barrister told me, "There are cab ranks and cab ranks. There are the Volkswagen kinds and there is my kind, which is more on the order of Rolls-Royce." But the rule remains that if the solicitor comes with a brief that is within his area of expertise, and if his time is not already booked, and if the fee that his clerk demands can be met, then the barrister must take the job, whatever his personal feelings. He may find himself on either side of a larcenous mess in Yorkshire. He may find himself prosecuting a bank robber for the Crown, or defending an IRA terrorist against the Crown. All he has to do is to fight as well as he can.

It is only natural for people brought up in this tradition to feel a certain pride when they step forward in lonely battle clad in the majesty of the law, and there is more than genteel self-mockery involved when they cite the lines they all know by heart, sung by the Lord Chancellor in the *Iolanthe* of W. S. Gilbert (of Inner Temple): "The Law is the true embodiment / Of everything that's excellent. / It has no kind of fault or flaw, / And I, my Lords, embody the Law."

These sentiments are not shared by everybody. For most of this century, the English legal system has been increasingly under attack at home for being antiquated, inefficient, unjust. The Bar especially has been attacked for forming a snobbish, clannish elite. It periodically introduces reforms, broadens its membership, tries to make its services more easily available. But the critics always say the reforms are too timid. Government after government has set up commissions to examine the structure of the legal system. They have introduced many modifications and innovations, but they have all left untouched the two main pillars of the system—the division between barristers and solicitors, and the independent status of each barrister on his cab rank.

In recent years, however, the system has shown signs of strains and cracking from within. In fact, in England these days people speak of the "Bar Wars."

It began with a great error in judgment made in the last century. The solicitors, organized in the Law Society, managed to secure for themselves a monopoly on what is called conveyancing, that is, all the paperwork, title search, etcetera, connected with the buying and selling of a piece of real estate. This is a comparatively easy and highly profitable form of work, and the solicitors were therefore somewhat less enterprising than they might have been in exploring other areas.

The result was that by the late 20th century they discovered that much of the business-related work that makes fortunes for American lawyers—taxes, for in-

Aides lead him, bearing purse, gilded mace of office.

Their status marked by lavender-trimmed robes, Circuit Judges join in the stately procession—a ritual that was begun during the Middle Ages.

Clerk trundles documents to court. Though British rely mostly on oral argument, the law requires paper.

stance—had slipped out of their hands into those of the giant accounting firms. This was bad enough. But then people began wondering in public just what justification there was for the conveyancing monopoly at all. Surely accounting firms, real estate agents and banks could do the work just as well, and perhaps more efficiently and more cheaply.

If they lost their monopoly, the solicitors of England might lose a third to a half of their income. Where were they to turn? One obvious place was the barrister's traditional turf. Why, after all, should only people who had taken meals at the Inns of Court have the right to appear in the upper courts? They claimed to have a special expertise in forensic tactics and courtroom skills. But the fact is that more than 90 percent of civil actions and prosecutions in England and Wales take place in courts presided over by magistrates or justices of the peace (who are mostly unpaid and untrained in the law, and form another of the curious glories of the English system). And in the lower courts solicitors can and do appear alongside barristers, examining witnesses like them, arguing like them, citing the same precedents. Why preserve an artificial barrier that had no real justification but its old age? Why not take the logical step of fusion, merging solicitors and barristers in one united order of attorneys?

Labor governments might have been expected to push for fusion in accordance with their leveling principles, but Labor governments came and went with no basic change. The attack when it came was from a totally unexpected quarter, the Conservative government of Margaret Thatcher. Mrs. Thatcher believed in free and open competition and hated restrictive practices of all kinds. In her eyes the Bar and the Law Society were not so much upholders of immemorial tradition as they were trade unions enforcing a closed shop that artificially hiked up the cost of legal services. In January 1989 her Lord Chancellor, Lord Mackay of Clashfern, presented a Green Paper, a proposal for legislation "for securing a better and more cost-effective service to the public from lawyers and the courts."

Contingency fees, a historic first

Lord Mackay is a Scot, brought up in a land with a different legal system from that of England and Wales. Unhampered by tradition, he called for more radical changes than any of the lawyers of England had seen in 700 years. The Green Paper proposed that the solicitors' monopoly on conveyancing be definitively wiped out. Solicitors would be allowed, having passed tests of their skill in advocacy, to appear in the higher courts, even to become judges there. So would others, including paralegals, if they had the necessary qualifications. Barristers would no longer be required to operate out of chambers. They need no longer be independent operators but might form partnerships with other barristers, or with solicitors, bankers, businessmen.

The job of setting professional standards and overseeing professional performance would no longer be left to organizations like the Law Society or the Council of the Bar, but would be shared with an Advisory Committee with 15 members, 8 of them nonlawyers. Barristers would be allowed to seek out clients directly, and sue them if they didn't pay, without waiting for solicitors to handle things. And for the first time in English history, lawyers would be permitted to take cases on a contingency fee.

Lord Mackay knew these were all controversial, but he must have been gobstruck by the howl of outrage that went up, not just from barristers who saw their whole way of life threatened with meltdown, but from all over the social and political spectrum. The furor crystallized in a memorable debate in the House of Lords. Stripped of all real political power in this egali-

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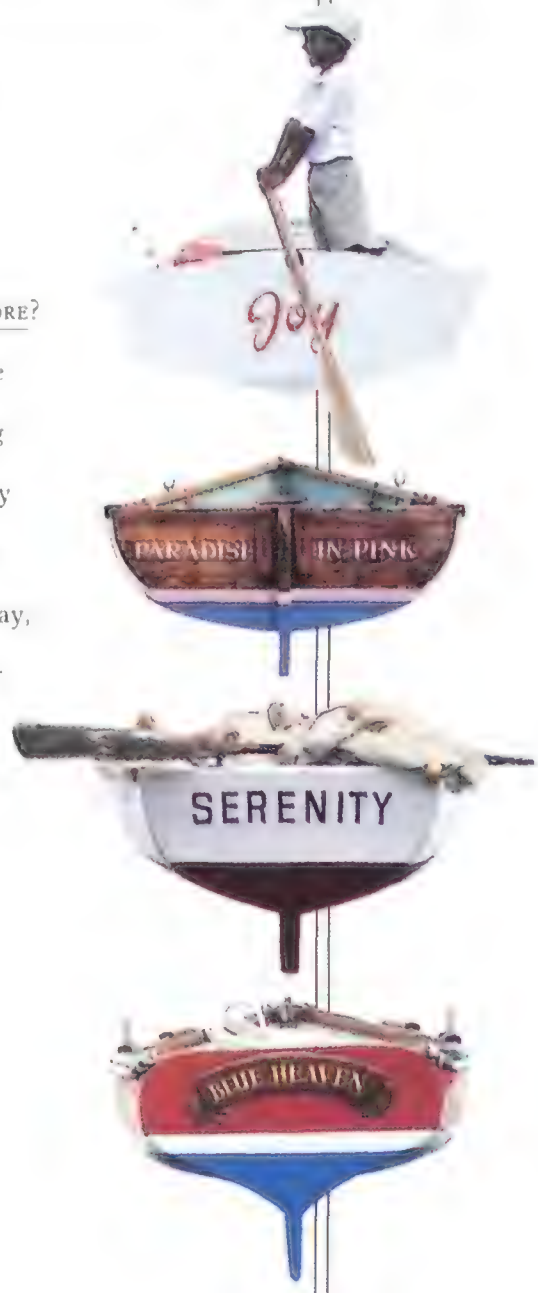

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Barrister leaves the arcade that runs from Lincoln's Inn to Carey Street, a main route to Law Courts. (Eighteen percent of barristers are women.) "T" and "N.G.C." over windows denote Inn's Treasurer in 1818, when the passageway was rebuilt.

tarian century, the Lords still have their pomp and their prestige and know how to make themselves listened to. Many of them are distinguished judges and lawyers, and among them sit the nine or so Law Lords who form the Court of Last Appeal at the summit of the English legal system. They have always seen themselves as the last line of defense of English liberties, whether against the tyranny of kings or the tyranny of the majority expressed by the House of Commons.

On an April Friday, they rallied round the liberties of the Bar. They remained in session from 9 in the morning till almost 11 at night—no other crisis in English society, it was noted, had ever been able to delay the start of a weekend like this—noble lord and lady rising after noble lord and lady to bait and berate and blast the Lord Chancellor as he sat imperturbable on the woolsack. For every one or two who defended him, like Viscount Bledisloe, who refused to drop a tear over those "somnolent anachronisms," the Inns of Court, there were a dozen to savage the Green Paper.

"A mass of claptrap," said Lord Hutchinson of Lullington. Swatting "a fly on our foreheads with a pickax," said the Earl of Onslow, warming to his subject; "I am not allowed to ask a parafarrier to shoe my horse." Why should standards be lower for lawyers than for blacksmiths? Detail by detail they tore it apart and attacked its basic concept of making the legal profession cost-effective. An institution that has developed slowly and subtly over 700 years, said Lord Hailsham, cannot be treated like a corner grocery store. The independence of the law was at stake, they said.

The Lord Chancellor proposed to put the legal profession under the administrative control of the Advisory Committee; many lords thought the committee should more appropriately be called a Quango. This unpleasant word, which stands for Quasi-Autonomous Non-Governmental Organization, was invented by the Tories to describe the entities set up after World War II by Labor governments to assist the state in its bureaucratic tasks. Any Quango that would rule the law would destroy the foundations of the country. "The Green Paper," said Lord Beloff, "suggests using one pillar of the British Constitution, namely parliamentary sovereignty, to overthrow the other pillar . . . the rule of law dependent upon an independent judiciary and independent legal system."

This argument struck a deeply responsive chord in the English psyche. The average Englishman's direct experience with the law is apt to be sordid and unpleasant, involving things like traffic accidents and petty larcenies. His opinion of lawyers is not necessarily high (the Earl of Onslow pointed out that of the nine references to lawyers in the *Oxford Book of Quotations*, not one is complimentary), but at the back of his mind he is aware that law and lawyers are necessary to his freedom. They are there today as they were on a Sunday in 1670 when William Penn and William Mead were arrested for "causing an unlawful and tumultuous assembly" by preaching in the middle of Gracechurch Street. When the jury hearing the case found them not guilty, the judge ordered it to change the verdict, and when the jurors refused he had them locked up "all night without meat, drink, fire or other accommodation; they had not so much as a chamber-pot, though desired." When they still refused, they were heavily fined and locked up again till one of them took a plea of habeas corpus to the Court of the King's Bench, and there Mr. Justice Vaughan established for all time that a defendant acquitted by an English court must be set free.

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Arbitrary power is not necessarily a thing of the past. England has no written constitution, and no Supreme Court in the American sense. There is nothing to prevent a majority of the House of Commons from voting any law it wants and then creating an apparatus of commissions and boards to administer it. The modern state is crammed with such bodies continually issuing orders to private citizens. Generally the private citizen can do little about it, except that by longstanding tradition judges have a right to intervene. The High Court Judges of England are appointed by the government, but they are all brought up in the fiercely independent tradition of the Bar. Once appointed they can be removed only by a vote of both houses of Parliament, and the only one ever so removed was Sir Jonah Barrington, of the High Court of Admiralty in Ireland, dismissed in 1830 for appropriating £922 to his own use.

In 1946, demobilized soldiers applying for disability pensions were told by the Ministry of Pensions that they had to prove that their disabilities had been caused by their service in the armed forces. Some of the soldiers went to law, and Mr. Justice Denning told the Ministry that the burden of proof was on it to show that the disabilities were not service-related. When the Ministry said that the time limit for filing applications had run out, Denning told it to extend the time limit. The Ministry obeyed.

In the long run, such memories were too strong even for Mrs. Thatcher's government, and it backed down. The final bill to reform the legal system passed through the House of Commons just before she fell from power last year. But it was only a pale reflection of the original Green Paper. Some of its more sensible features are still left—the conveyancing monopoly, for example, is finished. The Advisory Committee will almost certainly allow qualified solicitors into the higher courts. A very limited form of contingency fee will be permitted as well. Barristers will not be forced into partnerships, they will remain lone warriors as in the past. The Advisory Committee will codify professional standards, subject to veto by senior judges. Especially now, because of a few recently celebrated cases in which justice was flagrantly miscarried, there is public agitation for quick reforms. But the judges can probably be counted on to make sure that whatever changes come will be gradual, practical, English. The road of the law will go on rolling into the future the way it has for 700 years.

Before they can become barristers, students must eat 24 dinners, like this in Lincoln's Inn Great Hall. Rather new, it was opened by Queen Victoria in 1845.

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By Daniel Cohen

The place where Shangri-la and New Jersey meet

Staunch commitment to its diverse community—and treasures from Tibet to Timbuktu—make the Newark Museum a little corner of paradise

Mayor Sharpe James (far right) welcomes Archbishop Desmond Tutu and the Dalai Lama to the museum.

Clad in his maroon and yellow robes, the Dalai Lama, Tibet's exiled religious leader, ambled through galleries of art from his homeland at the Newark Museum, in New Jersey. He peered at a slingshot-shaped woman's headdress covered in pearls, hefty coral beads and turquoise. "Beautiful, but very uncomfortable," the high priest remarked to curators and public officials accompanying him. A moment later he turned to see South African Archbishop Desmond Tutu enter the room bearing salmon-hued roses. The Dalai Lama proffered a white silk scarf, a ceremonial gesture of honor in Tibetan etiquette. It was the first formal encounter of the two Nobel Peace Prize laureates.

With the glittering precincts of Manhattan just ten miles eastward, Newark, the Garden State's largest and in recent decades most imperiled city, might have seemed an unlikely venue for such summitry. Summer riots in the black community in 1967 had left Newark an emblem of urban decay, with some of the highest rates of crime, poverty and ill health. Its problems, in fact, began decades earlier, as its wealthy and then middle classes moved from Newark, one of the nation's premier manufacturing cities, to nearby suburbs. Blacks were still excluded from well-paying building trades, controlled less than 1 percent of the retail business and often lived in squalid housing. Even after investment of $6 billion in a downtown renaissance and the advent of interracial civic leadership, one-third of Newark's residents live in poverty.

Unlikely or not as a diplomatic host, the city's 82-year-old museum of art, science and industry had, in a sense, been ready for decades. The Newark Museum more than half a century ago began to assemble a pioneering collection of African art and to display works by often neglected black American artists. From its earliest days it had established its preeminence as a center of Tibetan art. And like the two apostles of nonviolence who met there last fall, it has tirelessly pursued a mission. Founded by city librarian John Cotton Dana in 1909, when seven out of every ten Newarkers were immigrants or their children, the museum's first exhibits—crafts from the newcomers' homelands and products of burgeoning city industry—targeted the non-elite.

Now that 77 percent of the city is black or Hispanic, the museum's education drive persists, with courses and events involving some 185,000 adults and children each year, one of the largest such programs in the country. The Newark aggressively lends museum pieces to area schools and neighborhood groups, and bolsters the city's troubled school system by bringing thousands of students to the museum for instruction.

Located in Essex County, with some of the nation's poorest and poshest precincts, the Newark Museum courts a broad spectrum of visitors (admission is free). On a given day they may include families cooing over cotton-top tamarins at the museum's mini zoo, preschoolers from a housing project's day-care center learning to paint, besuited office workers enjoying a garden jazz concert, blue-collar fans ogling antique fire trucks,

When fastened to hairpieces, these heavy turquoise pendants and the pearl-and-coral headdress (worn with the long part in back) graced the head of a Lhasa noblewoman at New Year's celebrations and weddings.

Photographs by Paul Solomon and Henry Groskinsky

Pieces such as Hiram Powers' *Greek Slave* (1847) make the Newark a must-see, says director Samuel C. Miller.

and meticulous suburbanites browsing decorative art.

Founded with a clear bias against masterpieces—"Beauty has no relation to price, rarity or age," Dana declared—the Newark Museum ended up with more than its share. Its treasures include not only the African and Tibetan holdings but exceptional examples of early modern American painting and sculpture, folk art, ceramics and glass, and arts of Korea, Japan and China. Curatorial doggedness, and in some cases benefactors' eccentricities, secured estimable collections of classical antiquities, native-American art, numismatics, mechanical models, and mineral and plant specimens.

Begun on the top floor of the Newark Public Library, the museum moved to its own building in 1926. Eventually, three additional buildings housed offices and classrooms. Yet, until completion of a four-year, $21 million make-over in 1989, there wasn't enough space to exhibit each major category of holdings at once. For museum director Samuel C. Miller, the goal of the project was clear: to hoist his municipal museum onto the list of must-see cultural stops in the Northeast Corridor, alongside such midsize museums as Hartford's Wadsworth Atheneum and the Walters Art Gallery of Baltimore (SMITHSONIAN, August 1989). "This museum has the rank to join them," he says.

The idea of spending public money (half the renovation cost) to attract out-of-town visitors at first aroused skepticism among social critics. But Miller never had the intention of considering the museum apart from its city, now 325 years old. He had taken his post in 1968, less than a year after riots had devastated parts of Newark; as one of his first tasks he squelched board sentiment to move the museum to the suburbs. "We're not just the beacon or oasis here. In this old, old city, even with a middle class on the run, we're part of a fabric, not the temple in the park," he says.

Making Newark interesting again

As it turns out, using cultural assets to boost a city's self-image and encourage investment has become part of the orthodoxy of urban renaissance. Spruced-up distinctions—the museum, Symphony Hall, the Cathedral of the Sacred Heart—and interracial political leadership have made Newark once again "interesting for reasons beyond its infamous urban pathologies," notes Rutgers University historian Clement A. Price. City officials hope civic pride will woo back upward strivers, black and white alike, as many as 54,000 of whom decamped in the past decade. "For the city to become whole—reduce crime, drug abuse and homelessness—it must have all those things that inspire people to dream and to become part of mainstream America," says Mayor Sharpe James.

Architect Michael Graves' interior redesign of the

eclectic four-building museum complex has become an attraction in its own right, a melding of disparate styles that evokes a neoclassical feeling overall. To keep costs down, Graves used vinyl tile instead of marble in the remodeling. "A faux-stone floor is entirely appropriate" in a historical context, he notes.

Perhaps only in a museum with so fierce an attachment to education could a $21 million overhaul be seen as a potential problem. Museum instructors fret that the fancier digs—an imposing staircase to the classrooms, more glamorous Junior Museum facilities—might intimidate the clientele, especially children, who found its old informal spaces inviting. "Down Washington Street, behind me, was the Newark Museum—I could see it without even looking: two oriental vases in front like spittoons for a rajah, and next to it the little annex to which we had traveled on special buses as schoolchildren," the young librarian Neil Klugman recalls in Philip Roth's novel *Goodbye, Columbus.* Indeed, for thousands of Newark youngsters a wall of massive mechanical models clattering in the basement was the stuff of earliest memories. Youth programs, with children singing or playing games, were often held in the exhibition galleries. No more.

An appreciation for order and beauty

"It was a very dowdy, comfortable place," acknowledges Miller, with a manner that blends art-world hauteur and Oregon-bred amiability. He has gotten the museum as far as he has with a pitch that plays well among politicians, aristocrats and community groups: "There's a generation of children who don't know what the world here once looked like," he says. "We must show them order, balance and beauty."

Although fewer children drop in on their own after school than in the past, about 20,000, ages 3 to 16, take part in Junior Museum programs annually. Family activities, like the recent "Color" festival, can lure a crowd of 1,500 to the museum for an afternoon of tie-dyeing, kaleidoscope-making and films. And in a typical year the museum hosts some 37,000 students from New Jersey schools for workshops and tours.

The two-hour sessions use museum objects not only to further the standard curriculum but to engage city youngsters' perceptions. In one session, Lucy Voorhees, assistant director of education, shows third-graders an 1858 children's portrait by Lilly Martin Spencer, one of America's first professional women artists, and asks them to draw their families. Then they play a round of morris, a 19th-century board game, and step into an original 1784 schoolhouse (dunce cap included) in the museum garden. "We try to hook their interest and stir their creative imagination," Voorhees says.

Competition runs keen for berths in 14 Saturday-

Works by contemporary New York and New Jersey artists are featured in the permanent collection.

Skylight and ficus trees lend a garden atmosphere to Engelhard Court, the museum's reception hall and café.

Leaves, tracks and target eyes adorn bark-cloth mask made to celebrate independence of Papua New Guinea.

Joseph Stella's five-panel *Voice of the City of New York Interpreted* (1920-22) is more than 20 feet long.

morning art or science workshops costing just $5 for eight sessions. For registration there's suddenly no hesitancy to brave downtown Newark. "I get there two hours early," says Linda Epps, a museum neighbor whose two sons began attending the classes nine years ago. "Colossal Creatures," in which 9-year-olds examine spiders, ants and worms up close and then take home their "creature environment," filled first last fall.

Of all Dana's educational schemes, perhaps none has had a greater impact than his Lending Collection. Beginning in 1912 he set aside 100 items from a donation of mineral specimens for circulation to schools. The collection has grown to 15,000 items: taxidermied birds, precise architectural models, objects of daily use from Africa, Latin America and Europe, herbariums, glittering Japanese lacquered inro, historic clothing, and more. The most popular item among borrowers may be the 2,000-year-old crocodile mummy.

The Lending Collection embodies Dana's didactic vision of a museum created "to give pleasure, to make manners seem more important, to promote skill, to exalt hand-work and to increase the zest of life." A museum van delivers objects to city schools on a thrice-weekly schedule that has scarcely changed in 65 years. Its route includes Martin Luther King Elementary in the West Ward, where little of the Newark renaissance reaches. The children are jaded witnesses to crime and drug use, but objects from the museum can still impress them, says Juanita Megaro Lister, a teacher there for 26 years. "The museum sends priceless, perfect objects—a child's kimono, inlaid chopsticks—and the students immediately see how fragile these are, and respect it. Nothing was ever stolen or damaged," she says. The collection is always in demand by school districts statewide, which take more than 2,000 loans a year.

From the outset Dana gleefully took on the role of museology's enfant terrible, even claiming that Henry Ford was a great artist. In 1912 he organized the 1,300-object show "Modern German Applied Arts." The first American museum showing of industrial arts and the first of modern German decorative arts, it toured widely, despite the refusal of New York's Metropolitan Museum of Art to mount it because of commercial overtones. Dana never gave up his grudge against the Met, later writing a polemical pamphlet, "The Gloom of the Museum," which ridiculed galleries that served only as "gazing museums" for the elite.

When it came to promoting modern decorative arts,

Daniel Cohen, a Garden State resident, went back to summer camp for the August 1990 SMITHSONIAN *and served up a story on cook-offs in September 1988.*

The dynamic rendering of skyscrapers (central panel) flanked by the Great White Way, the bridge (right) and the port (left) depicts a bustling city of steel and concrete, charged with the blare of sounds and lights.

as well as being accessible and courteous to the public, Dana admired department stores. "He saw the museum as a department store for modern ideas of good taste," says decorative arts curator Ulysses G. Dietz. Among the Newark's first purchases were art glass and pottery bought from area retailers, where pieces by Robineau, Grueby and Pewabic rarely cost more than $20 (and often as little as a dollar). Later, Dana mounted "Inexpensive Articles of Good Design," items from local five-and-dimes that cost under 50 cents. It became an annual event and forerunner of displays of museum-approved consumer products. "I bought Japanese pottery and American glass. The idea was to prove if you had a trained eye you could buy beauty at low cost," says Janet Lowenstein, who began work at the museum in 1931, two years after Dana's death.

In 1925 Dana created a museum apprenticeship program. One of the first to offer on-the-job training, it sent 108 graduates to museums nationwide. And a group of women Dana trained succeeded him in turn as director for the next 40 years, making the Newark one of few museums to be so consistently headed by a woman. (The first of them, his assistant, the formidable Beatrice Winser, was known for an iron will that kept the museum afloat through the Depression.)

Dana challenged his own taste along with the public's, hanging examples of modernism even before the legendary Armory Show galvanized New York in 1913. He confessed to not understanding the work of Max Weber but gave the avant-garde artist a show that same year. Exhibits by Robert Henri, George Luks, John Sloan and Stuart Davis followed. Dana's adventuresome spirit outlived him, but fitfully. In 1937 the museum roused itself to acquire Joseph Stella's monumental five-panel painting *The Voice of the City of New York Interpreted* (above), but later sat out Abstract Expressionism and missed its chance at early Pop Art. Now it tries to keep up with contemporary artists.

Though he scorned the kind of treasure house many of Newark's well-born might have preferred, Dana, a shopkeeper's son, skillfully wooed support from regional merchants. Department store magnate Louis Bamberger, founder of Newark's largest emporium, proved the museum's sturdiest benefactor. In 1926 he built Dana a $750,000 Beaux-Arts-style museum—downtown, as Dana had insisted—that allowed the collections to move out of the library's top floor. The Bamberger family then donated core works in the museum's contemporary American painting, folk art and rare coins collections.

Changes that would afflict Newark were already under way. Even as they inaugurated the new museum

building, the mercantile elite had nearly all fled the crowded city for the suburbs. In succeeding decades, the middle class followed; the city's per-capita income now runs just half that of the state. Racial hostilities, postwar federal policies that underwrote suburban mortgages but promoted high-rise public housing in cities, and malfeasance in municipal government in the 1960s exacerbated the problems.

Cultural support, meanwhile, flowed to New York. The Metropolitan Museum, Dana's old nemesis, lured twice as many Garden Staters to become members as did the Newark. Foundation gifts endowed by Newark's precious-metals magnate, Charles W. Engelhard, helped turn the Met's lackluster American Wing into a glittering dynamo in the '70s. It was a scale of giving that stunned some in his beleaguered hometown.

The museum's fortunes, like Newark's, skidded far down before turning around. In 1969 the destitute city government, the museum's key backer, voted to cut off funds to try to force the better-off state and county to contribute to operations. Penury and post-riot jitters wiped out a plan by the board to raze the Ballantine House, a brewer's mansion next door to the museum. The museum had acquired it in 1937 for offices and then planned to replace it with a modern building. Delay fortuitously allowed the Ballantine House to be recognized—and restored—as a late Victorian classic. A third building housed galleries and provided storage. In 1982 the city donated a former YWCA building for the museum's education center. To maximize the use of the four structures, Graves designed a rehab within existing walls that doubled the amount of gallery space. Mrs. Charles W. Engelhard kicked off the renovation fundraising drive with a million-dollar gift.

At the same time, the museum strengthened its ties to Newark's black majority. Joining an emergency city-wide arts campaign after the 1967 riots, "we were in the streets with our pottery wheels," says education director Susan Newberry. Afterward community leaders such as Newark-born playwright and poet Amiri Baraka (LeRoi Jones) sought to make the city a center of African-American culture. In 1975 the museum launched an annual Black Film Festival. Lectures by the writers Nikki Giovanni, Maya Angelou and Alex Haley, actors Ruby Dee and Ossie Davis, and artist Romare Bearden have drawn overflow crowds.

Scholarship as well as showmanship guided a groundbreaking show of black painters and sculptors in 1990. The museum's first major exhibit after reopening, it was assembled by the late Gary A. Reynolds, curator of painting and sculpture. "Against the Odds: African-American Artists and the Harmon Foundation" in part reprised an exhibit the museum had hosted 59 years earlier. The Harmon Foundation, created by real estate developer William E. Harmon (who had spent his youth on the Western plains with a

Not just a "gazing museum," the Newark draws school groups, families and downtown workers with activities that teach and delight. In museum's garden (left), jazz fans enjoy a free concert, a summertime staple.

black cavalry regiment in which his father was a white officer), gave awards for achievements by blacks. In 1928 the foundation began mounting juried exhibitions that gave dozens of black artists their first chance to be seen by a broad audience—including, in 1931, that of the Newark Museum.

The museum followed up with simultaneous one-man shows last winter by the New Yorkers Jack Whitten, an abstract painter who experiments with acrylic castings, and Tyrone Mitchell, who creates color-saturated organic forms sculpted in wood. Both have 30-year careers but surprisingly sparse museum exposure. The museum backed the exhibits with full catalogs on each—and made sure to hang them in November, expanding its calendar of black art beyond February's Black History Month.

When it came to African art—one of the most popular permanent exhibits—Dana's mania for teaching again rebounded to the museum's benefit. Favoring objects that revealed daily life as well as artistic form, and strapped for acquisition cash, Dana acquired field collections in the 1920s through missionaries, business people and travelers, and twice went shopping in North Africa himself. As a result, the museum has an unusual number of pieces—such as a Kuba chief's shirt from Zaire, bedecked with cowrie shells, leopard patches and copper plates, and a masterful Yoruba mask with a tiered headdress (p. 100)—for which the artist, date of creation and use in ceremonies are known.

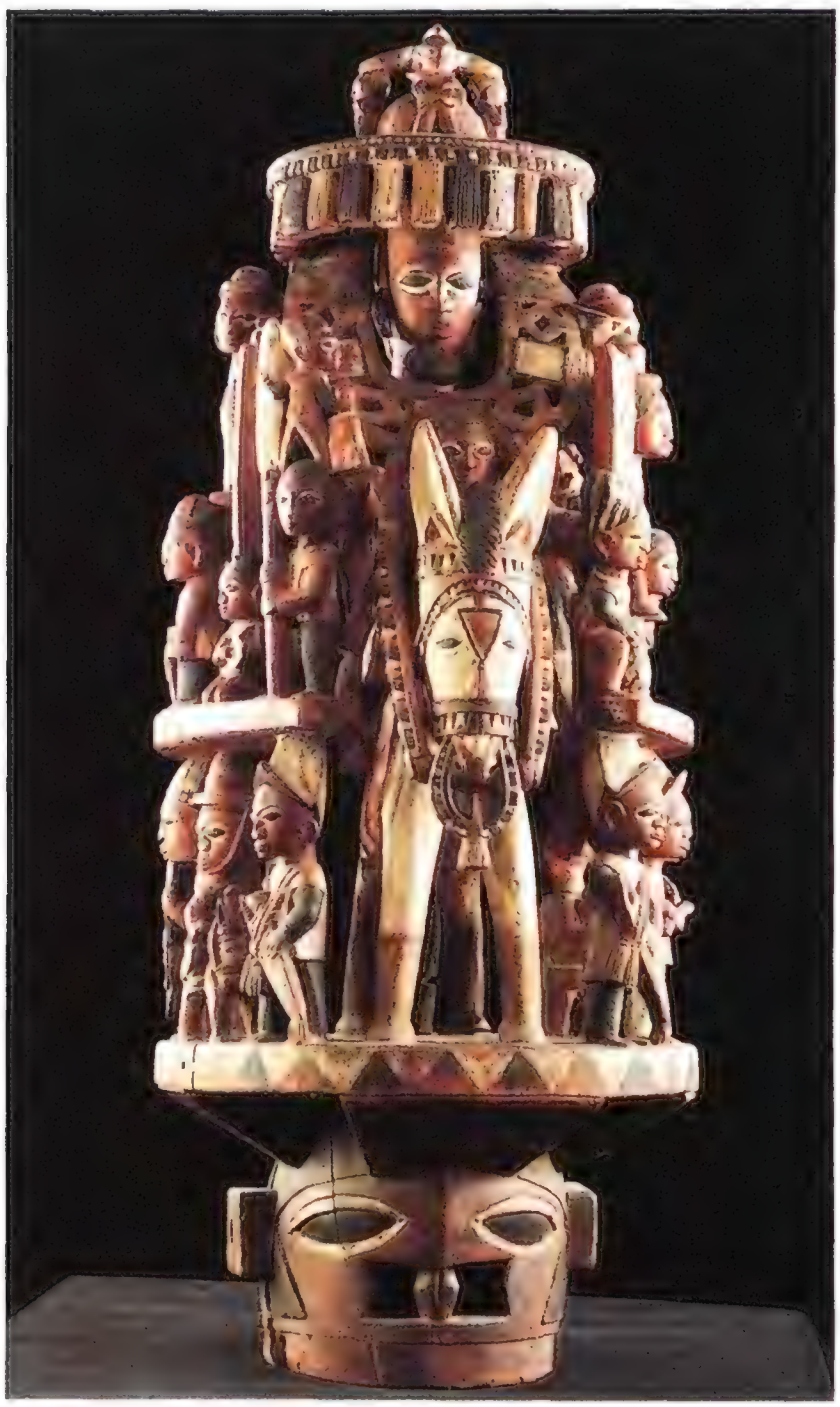
As did Dana 70 years ago, ethnology curator Anne M. Spencer occasionally uses agents in the field. One recently brought back from Papua New Guinea a four-foot-high bark-cloth mask with birdlike visage and huge painted eyes (p. 96). It had been worn at dances to celebrate the tenth anniversary of national independence and was to have been discarded. Spencer, a student at Makerere University in Uganda in the '60s, also collects a purely contemporary African art form, brightly colored machine-printed cloths that commemorate political and cultural events. A recent cloth honors the Cameroon soccer team for reaching the quarterfinals of the 1990 World Cup; it features the mascot "indomitable lion" with a border of soccer balls. The Newark's 100 cloth specimens are unmatched at any other American museum. "If you fail to look at what's happening now, you may not be able to collect it in 75 years," Spencer says.

The founding of the Newark's Tibetan art collection almost prophetically preceded, by half a century, the emergence of a nearby Tibetan community. In 1910 the American physician Albert L. Shelton, sailing home on leave after six years as a missionary near the battle-torn Sino-Tibetan border, met on the ship a trustee of the year-old museum. Shelton had gathered 150 artifacts from ruined monasteries and displaced wealthy families in Eastern Tibet. "People must have

Schoolchildren peer at cotton-top tamarins, one of 30 species in the museum's mini zoo (center). Guests at last fall's altar rededication ceremony make Tibetan prayer flags with printing blocks and muslin (above).

trusted him. He could acquire objects otherwise never given to foreigners, including volumes from royal libraries and the most important monasteries," says Valrae Reynolds, curator of Oriental collections.

Shelton hoped to sell his collection to finance his relief work; the trustee, Edward N. Crane, helped him arrange a showing at the museum's galleries, then atop the library. When Crane died unexpectedly, his family bought the collection for the museum as a memorial. That gift catapulted the fledgling institution to the front ranks in Tibetan holdings. In the next three decades the museum acquired four more missionary collections. Prize pieces include jewelry of blood-red coral, pearls, gold and indigenous black-and-white *tzi* beads, whose origins remain a mystery to scholars; and a three-piece woven yak-hair tent. "We went crazy trying to put it together," recalls Reynolds.



Five-foot-tall, 80-pound helmet mask (1920), by noted carver Bamgboye, honors greatness of Yoruba people.

Tibetans first visited Newark in 1948 with a trade delegation organized by C. Suydam Cutting. A friend of Theodore Roosevelt's children, Cutting accompanied them on natural history expeditions and had sought permission in the 1930s to collect rare specimens in Tibet. The request was denied, but a correspondence with the 13th Dalai Lama (predecessor of the current spiritual leader) led to an invitation to become the first American allowed into the holy city of Lhasa. Cutting's photographs and Shelton's from a generation earlier form an invaluable archive at the museum.

Then, in the 1960s, a small group of Tibetan refugees fleeing Chinese forces were resettled in New Jersey. The Tibetans began visiting the museum, especially an altar painted on particleboard by Works Progress Administration artists during the 1930s, in which Tibetan relics were shown. Visits from the Dalai Lama in 1979 and 1981 gave the site added religious significance.

In 1988 a ranking Tibetan Buddhist priest deconsecrated the shrine so rebuilding could begin. With remnants of the old ritualistically embedded in the rebuilt altar, Phuntsok Dorje, who at the age of 10 began an 11-year apprenticeship to a Tibetan master artisan, repainted the shrine in the traditional, dazzling rainbow hues and rigorously ornate designs, with gold patterning in relief. "That took two years of practice," says Dorje, who worked in the gallery for 14 months. At his September 1990 visit, the Dalai Lama conducted a prayer ceremony there to invite celestial spirits to return, making the altar the rare museum exhibit consecrated by a religion's highest priest.

Unalloyed euphoria surrounding the Newark's gala reopening lasted just seven months. Insufficient state funding—including a smaller grant from the New Jersey State Council on the Arts—forced the museum to close an extra day each week and to lay off a tenth of its staff. It was unnervingly like a return to hard times the museum thought it had outgrown.

But the Newark Museum's spiffier home and welcoming attitude have borne fruit. A New Jersey heiress in 1989 bequeathed it a valuable collection of American Impressionism, and the state's Lenox China company lately made it the only museum outside the Smithsonian's National Museum of American History to have a place setting from each of its five sets of Presidential dinnerware. Perhaps Yvonne Whaley, a Newark resident picnicking at a noon garden concert, saw the assets most clearly: "There's a warmth and accessibility here. People feel they're part of the museum. I'm so proud of it."

Brandon Glenn and Danielle Liverpool admire their new look in African attire at a "cultural dress-up."

Czar's troops quash uprising by young idealists in St. Petersburg's Senate Square on December 14, 1825.

By Ruth Daniloff

How Czar Nicholas was outfoxed by the guardian angels

Russian noblewomen raised a ruckus when their men were sent to prison; so did the wife of an American writer who was snatched by the KGB

The rebels were later dubbed the "Decembrists"; those who survived the daylong revolt were sent to Siberia.

In late August 1986 when the KGB took my husband, Nicholas, hostage in retaliation for the FBI's arrest of a Soviet spy in New York City, a Russian friend braved the security men who surrounded our Moscow apartment to visit me. As we sat around the kitchen table nervously drinking tea, I explained to her how, four days earlier, Nick had received a phone call from a Soviet acquaintance named Misha. It was the end of our five-year journalistic assignment in the USSR, and Misha had wanted to say goodbye in person. At the arranged meeting in nearby Lenin Hills, he gave Nick a packet—a farewell gift. As Nick left the park he was arrested and rushed to infamous Lefortovo prison, where Misha's "gift" was opened. It contained photographs—marked "top secret"—of military sites. Nick was thrown into a cell and accused of espionage.

My friend was not overly surprised by my story. Such an obvious setup was a typical KGB trick, she said. Then she smiled: "Now you are getting a taste of what it must have been like for the wives of the Decembrists." She was referring to the handful of women who had insisted on joining their husbands and lovers in Siberia, where the men were imprisoned for attempting to overthrow Czar Nicholas I in St. Petersburg (now Leningrad) in December 1825.

Guidance from a great-great-grandfather

I first became aware of the wives of the "Decembrists," as the conspirators are called, through my husband's research on his great-great-grandfather Alexander Frolov, a young lieutenant who received 30 years' hard labor and eternal exile for a negligible role in that ill-fated plan to eliminate the czar. In his memoirs, Frolov referred to the women as "guardian angels," crediting them with the prisoners' survival. As I learned more about these courageous women, who undertook a 4,000-mile journey into the icy wastelands of Siberia to save their men (see the map on page 108), I became convinced that without their wives, the rebels would have disappeared from history, just as the czar had wanted. Certainly they would not have become the legendary figures they are today in the Soviet Union.

At the time of Nick's arrest, reference to the women who ended up in Siberia unnerved me. When I received his phone call from Lefortovo, I had a premonition that history was repeating itself—that Nick was destined to follow in the steps of his great-great-grandfather. Later, realizing that the best way to extract my husband from the jaws of the KGB was to keep his plight on the front page, I recalled how these women had pitted their wills against Czar Nicholas. I drew strength from their example.

While there's no comparison between the four weeks that I spent in Moscow protesting Nick's unlawful arrest (he was released on September 30) and the long years that the Decembrist women suffered in Siberia, political similarities do exist between the Russia of 1825 and the Soviet Union of 1986. Leaders whose citizens enjoy little protection under the law tend to be sensitive to their own public image abroad. This is particularly true in Russia, with its long-lived inferiority complex vis-à-vis the West. At the time of Nick's arrest, Mikhail Gorbachev was launching his *glasnost* policy and trying to convince the world of the USSR's changing face; after the arrest of the Decembrists, Czar Nicholas was fending off criticism of his

Czar Nicholas reacted to rebellion by setting up a censorship system and a proto-KGB secret police force.

authoritarian rule. The last thing either wanted was for his barbarities to be trumpeted around the world.

From the perspective of the 1990s—when self-fulfillment tends to be the driving force in women's lives—it is hard to understand what motivated the Decembrist women to sacrifice everything, including children, to go to Siberia. Why did women like Princess Volkonskaya and Princess Trubetskaya exchange luxury and privilege for penal-colony hovels, temperatures of 40 below, sadistic guards and endless harassment by the czar's officials? Not only did they defy the czar, but they also defied fathers and brothers—behavior unheard of in those days. According to Russian writers and historians past and present, the explanation is simple: the women placed the interests of their menfolk above their own. "They abandoned everything," wrote Dostoevsky, "noble rank, wealthy connections and family, sacrificing everything in the name of the highest moral duty." They embodied ideal Russian womanhood, proclaimed the poets of the time, who waxed lyrical over the "guardian angels," even though two of them, Paulina Gueble and Camilla Le-Dantu, were French.

Undoubtedly their decision was triggered by duty, as the poet Pushkin and others declared. After all, duty was one of the 19th century's most prized characteristics, especially in Russian society, largely organized along military lines. Still, I suspect there was more to it than that. The rebels' imprisonment allowed the women to rise above their ordained role in life. A unique role reversal took place: the men became dependent upon the women. Suddenly the women had a mission; they acquired power. No matter how horrendous the suffering in Siberia, their lives now had meaning. Theirs was a life-and-death struggle between a czar determined to save his empire from the reforms sweeping Europe in the wake of the French Revolution, and a handful of women determined to save their men and the democratic ideals they represented.

In 1855 Maria Volkonskaya recalled a Siberian day in 1827: "I heard the clanging of iron on the stone floor, then my husband stood before me and I saw his legs were held in heavy chains," she noted in her memoirs upon returning to Russia after 28 years in exile. "Only then did I fully realize the sacrifices required to fight for liberty in our country." To the amazement of the guards, the princess dropped to her knees and kissed the prince's iron shackles.

When she had left Moscow for Siberia, Maria was only 20, the daughter of a hero of the Napoleonic Wars. Growing up on a huge estate in the Ukraine, she had been dubbed "Princess of the Ganges" because of her dark eyes and hair. Her thick locks, according to Pushkin, were "more lustrous than daylight and darker than night." He was so attracted to the young Maria that he immortalized her in several of his works, and many biographers believe he was secretly in love with her until his death.

In 1827, the emaciated convict in vermin-infested rags who shuffled out of the bowels of the Nerchinsk prison to greet Maria was His Highness Maj. Gen. Prince Sergei Volkonsky, scion of one of Russia's most illustrious families. Her father had encouraged her marriage to a Volkonsky—the family was immensely wealthy, with close ties to the imperial court. The prince was one of 121 men banished to Siberia for his role in the plot to destroy the monarchy, free the serfs and bring constitutional government to Russia.

Like Volkonsky, most of the rebels who assembled in St. Petersburg's Senate Square on the icy morning of December 14, 1825, were the cream of Russian society: nobles, military officers, philosophers, poets. They were young idealists—their average age was 26, and many were in their teens—who had been influenced by the new ideas of freedom and justice of the American and French revolutions. Like reformers in the Soviet Union today, they saw Russia falling farther and farther behind the rest of the world. Had the coup succeeded, the Decembrists might have become Russia's

Ruth Daniloff is working on a novel and screenplay about the Decembrist wives. She wrote on church restoration in the USSR for the March 1983 issue.

Prince Sergei Volkonsky was one of rebels who ended up in chains for trying to overthrow the monarchy.

Maria Volkonskaya begged czar to let her follow her husband; he said she could go—but not their baby son.

founding fathers, and the nation spared great suffering.

The uprising failed largely because it was thrown together hastily to take advantage of the sudden death of Alexander I, in November 1825. Also, the new ruler, Nicholas I, learned of the plot through one of his informers. After trying—and failing—to quash the uprising peacefully during the daylong standoff, and fearing his troops might defect to the rebels after dark, he ordered the artillery to fire. That night the square was littered with dead and wounded, and the frozen surface of the Neva River pockmarked with holes where fleeing rebels had fallen through the ice.

If not for the uprising, Nicholas might have gone down in history as a reformer. The rebellion, however, set the stage for his 30-year reign and provoked retaliatory measures, such as a censorship system and a secret police force—his political arm and forerunner of the KGB. In his eyes, the attempt to overthrow him was a personal betrayal—the rebels were officers in his beloved army. Many were his friends: they had participated in campaigns together; he had danced with their wives and sisters. No wonder he became obsessed by the Decembrists, especially since his father had been assassinated by palace conspirators. After the rebels were arrested, Nicholas insisted on interrogating each one. With some he flew into a violent rage. He yelled at Alexander Frolov, my husband's ancestor, kicked him in the shins and issued orders for his solitary confinement in the Peter Paul Fortress, although Frolov hadn't even been in St. Petersburg at the time of the uprising. "It is my duty to give a lesson to Russia," the czar said after hanging the five ringleaders.

The confrontation between Nicholas and the wives began soon after the sentencing of their husbands, in July 1826. When the czar learned that several of the women, including the Princesses Volkonskaya and Trubetskaya, wanted to follow their men to Siberia, he resolved to stop them. Since travel documents were required for moving around the empire, the women needed government permission. Normally, Nicholas encouraged families to accompany prisoners to Siberia. It was a way of settling the periphery of his huge empire. But the Decembrists' wives were a different matter. He feared they "would see to it that their husbands were enshrined as martyrs." He was determined to eradicate the "traitors" from history so they could not "poison the minds of other Russians with their liberal heresies."

Nicholas hesitated to ban outright the women's departure, since he would have appeared heartless in the eyes of some of the most powerful families in Russia. Instead, he created obstacles to force the women to change their minds. He made it known that children would not be allowed to accompany their mothers into exile. When Maria Volkonskaya, who had given birth

to a son a few weeks after the rebellion, learned of this, she dispatched a letter to the czar pleading for permission to join her husband. "My son is happy," she argued, "but my husband is unhappy and needs me more." Nicholas relented—Maria, yes; the baby, no—but not without an underlying threat. "You are undoubtedly aware of the particular interest I have always taken in your personal welfare," he wrote her in December 1826, "and . . . I feel it is my duty to warn you against the extreme danger that awaits you once you have traveled beyond Irkutsk."

A defiant countess follows her "genius"

Over the next few years, despite imperial threats and family opposition, 11 women left for Siberia. One of the first was Alexandrine Muravieva, the 21-year-old wife of Nikita Muraviev, the leading thinker behind the Decembrist movement. With her green eyes and mass of auburn hair, she was one of the reigning beauties of St. Petersburg. The young countess had been raised in immense luxury and educated to do everything a 19th-century lady was supposed to do—sing, paint, play the piano. At 18 she married Nikita, whom she referred to as "my genius."

Alexandrine was quickly followed by Maria and Princess Ekaterina Trubetskaya, a small, rotund young woman with a pug nose, which one observer anticipated would eventually assume the shape of a potato. Her husband was Prince Sergei Trubetskoy, a leader of the uprising; her father, one of the wealthiest nobles in Russia. Despite having been raised in a huge palace in St. Petersburg, Ekaterina was very down to earth—and deeply in love with her husband. Another member of the group was Paulina Gueble, a feisty young Frenchwoman who battled for two years for permission to join and marry her Decembrist lover, a wealthy young aristocrat who was a lieutenant in the Horse Guards. Unlike the noblewomen, Paulina's background was modest. She was the daughter of a French Army officer and had traveled to St. Petersburg to seek her fortune as a dressmaker. There she met her lieutenant; at the time of the revolt she was expecting his child.

For the women, obtaining the czar's permission to travel to Siberia was only the first step. The 4,000-mile journey, which took from three months to a year depending on whether one traveled by sledge, carriage or foot, was an ordeal in itself. In the winter snowstorms, even the most tested drivers careened off the primitive track. Passengers' bodies would be discovered in the spring—if the wolves didn't eat them first. After issuing travel documents to the women, Nicholas ordered officials along the Moscow-Siberia post road to persuade them "by all possible means" to turn back. In Irkutsk, the last civilized outpost before the wilderness,

Prisoners were sent to an abandoned Cossack fort at Chita, near Lake Baikal, by fearful, vengeful czar.

Isolated, they couldn't subvert others with "liberal heresies." One rebel portrayed main street in 1829-30.

Exile Alexander Frolov, an ancestor of the author's husband, received lifesaving seeds, tools, from Maria.

Watercolor of Andrei Rozen and wife, Anna, was done in Petrovsky Zavod, defying czar's "no portraits" edict.

the governor, General Zeidler, praised the travelers for discharging their wifely duties, but warned of marauding bands of convicts who would attack if they ventured beyond the city, and of the dangers of crossing Lake Baikal, where, if the sledge didn't plunge into a crevasse, the horses would surely crash on the ice, never to rise again.

"Governor Zeidler repeated himself like a parrot," Maria wrote her mother. "I had heard the same speech so many times along the way. He, of course, was following instructions, just like the others. His Majesty the Czar did not at all like the idea of us young wives following our 'criminal husbands' into exile."

When persuasion failed, the governor dropped a bombshell. If the women insisted on joining their husbands, they would relinquish all rights: titles, wealth, servants, and the right to ever return to Russia. That meant they would never see their children again. Furthermore, any children born in Siberia would become the property of the state. No women turned back, although between them they had left 19 children behind. Even after Maria Volkonskaya signed away her rights, the governor continued to harass her. To travel to the Transbaikal area she would need additional documents, he said, but since she was a "nonperson" how could he issue them? Finally, he issued the papers in the name of Maria's Cossack driver. The governor's parting shot was a customs search: a dozen ruffians opened every item of baggage, emptying food in the snow and stealing sacks of flour and sugar.

In the late winter of 1827, Maria and Ekaterina found their husbands in a desolate prison colony—one of many in the Nerchinsk mine region—some 15 miles from the Chinese border. The colony, with eight Decembrists and many murderers, thieves and highwaymen, consisted of a stockade and several ramshackle houses for prison officials. Close by was a village of Cossacks, who were responsible for order in the region, and an encampment of Buryat and Mongol tribesmen. All trees within a 20-mile radius of the prison had been cut to prevent escapes. The temperature was 40 below, and a glacial wind swept off the nearby mountains.

Coping heroically with culture shock

The two princesses' adjustment to conditions in the penal colony was surprising, considering that they had been raised in households with large retinues of servants. At first, they slept on the floor of a peasant shack, so cramped that when they lay down, their heads touched one wall and their feet the other. Small windows covered with fish skin barely let in the light; the stove smoked continually. The wives' first task was to learn to prepare food—a struggle, since most had never done it. They made a great effort to keep up

Perilous 4,000-mile route of Decembrists and most of their wives—from St. Petersburg to Siberian prisons and Irkutsk, where many would live in eternal exile—is marked. The author traveled from Moscow, by air.

appearances, especially Ekaterina, who insisted on donning a fashionable fur coat and plumed hat even when driving around the village in a peasant cart. Dressing like a lady was not only good for morale, it also reinforced the women's social status with the prison personnel. As I discovered 160 years later with my husband's prison interrogator, in certain situations where men hold total power, a perverse gallantry often develops toward women. As long as I was polite, begged a little and smiled, he was willing to make some concessions, such as allowing Nick to have extra food or books in his cell.

Then as now, getting around the guards is vital to a prisoner's well-being. Having prepared the food, the wives bribed the guards to sneak it in; they were allowed to visit twice a week, but only in the presence of a guard. It is evident from the archives of the czar's secret police that by the time the women arrived, the men were badly in need of care: "Trubetskoy suffers from what appears to be a malady of the lungs . . . he is spitting blood" (December 27, 1826); "Volkonsky has been ill for more than a week. . . . Typhoid fever is suspected" (April 1, 1827).

The tradition of taking food to prisoners still exists in Russia. When I visited Nick in Lefortovo, I carried rations to supplement his miserable diet of buckwheat gruel and potatoes. The guard would scrutinize the package for items that could be used for suicide or escape, such as razor blades and poison. Tea, coffee and chocolate were confiscated as being stimulants, which, God forbid, could lead to "insurrection."

Maria and Ekaterina had been at the penal colony for only a few weeks when they experienced their first major confrontation with the prison authorities, triggered when the prisoners went on a hunger strike to protest the confiscation of candles from their cells. The commandant accused the men of mutiny, a crime punishable by death. When the women learned of it, they dressed in their finery and took up positions on a boulder outside the prison, where they shouted words of encouragement to their men and gleaned information from the guards. Their vigil lasted two days and three nights. In the end, the commandant returned the candles. A drunken sadist, he raged against the restrictions placed on him both by the czar, who decreed that the "state criminals be occupied, but not worked to the detriment of their health," and the women, who didn't hesitate to complain to their influential families back home. "The Devil take the prisoners!" he told Maria when she reminded him of his responsibility. "What stupid instructions! If it wasn't for this laughable stipulation I would have shot them long ago." Without the women as witnesses, it would have been easy to do so, passing a death off as an accident.

Back in St. Petersburg, Nicholas awaited the weekly reports on the "traitors." He appointed Gen. Stanislav Leparsky, a Russified Pole, as the new commandant, believing that the retired general, known for his

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Alexandrine Muravieva (left) was among the first of the wives to brave Siberia; French-born Paulina Gueble, a Russian lieutenant's woman, taught them how to cook; Ekaterina Trubetskaya died in exile.

humaneness, would reduce the number of stories about barbaric prison conditions trickling home via the wives. The czar's fear that the rebels would contaminate the population of the Nerchinsk region now inspired him to assemble them all at a remote area, Chita, near Lake Baikal. There, life improved for the Decembrists, though that was not Nicholas' intention. "The dungeon united us all together, gave us mutual support and finally, thanks to our angels of rescue, the ladies, united us with a world from which we had been separated forever by political death," wrote one in his memoirs.

The women offered one another support, pooling their skills and lobbying to improve conditions. They worked to soften up the commandant, who soon realized he had the brightest minds in Russia under his roof. Over the years—at Chita and later, when they were moved to a permanent prison at Petrovsky Zavod—an understanding developed between the Decembrists and the old general. As long as the prisoners made no attempt to escape and looked miserable during visits by the czar's inspectors, he was prepared to reduce the work load, remove the leg irons the men had been wearing night and day for 26 months, allow the couples more time and privacy for their meetings, and otherwise support the wives in their efforts to make life more tolerable for their husbands.

Having failed to create an ideal society in Russia, the Decembrists started to build one behind bars. (Nowadays, Decembrist-history buffs claim that never before—or since—has so much talent been brought together as in the prisons of Chita and Petrovsky Zavod.) But without the women this extraordinary, self-sufficient commune would not have flourished. Since the men were forbidden to communicate with the outside world, the women did it for them. Maria, for example, wrote letters—up to 30 a week—for men who had no wives to do it. The women ordered supplies for vegetable gardens, and books, journals, and scientific and technical manuals for setting up artisans workshops and an academy of learning. At least ten languages were offered, along with chemistry, geology, literature, economics, anatomy and military strategy. Soon local people were attending lectures and concerts at the prison.

So that letters, books and supplies could get through, the women organized an underground postal service. Normally correspondence was censored by the prison commandant, the authorities in Irkutsk and the secret police in St. Petersburg. My husband's great-great-grandfather recalled cobbling shoes with special hiding places in the soles for messages: "Usually there were three servants on the go, such that when one arrived in St. Petersburg, another was en route, and a third just arrived in Siberia."

When the wives were not battling the authorities, their lives had much in common with American pioneer women. They gave birth, tended the land, raised livestock. The hard life took its toll: death, illness and loneliness were routine. Children tended to die more often than live; the 11 women lost 22 children. "In the entire surrounding landscape I can see only one thing: the new cross on the grave of my child. How will I ever find courage to live here and look after Sergei, whose health has taken a turn for the worse," Maria wrote in July 1830 after the death of a baby daughter. Earlier, she had learned that the son she left behind in Russia had died, leaving her wracked with guilt.

As the prisoners' terms of hard labor came to an end, they were dispatched to godforsaken little settlements around Siberia to start bleak new lives in eternal exile. Maria and Ekaterina kept in touch with the exiles, soliciting money from the wealthier families to help the poorer ones. When one of the most radical

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Guardian angels: the Decembrist wives

Decembrists was rearrested in 1840 for his writing and dispatched to the most brutal prison colony, Maria risked her own safety to help him: "I sent him books, chocolates for his chest, and under the guise of medicine, powdered milk with steel pens concealed inside, for everything had been taken from him and he had been forbidden to write."

It was largely thanks to the women's continuous support that the Decembrists made such a cultural and scientific contribution to Siberia. Once the prisoners were resettled, they opened schools and hospitals and introduced modern farming methods, including crop rotation. Also, they produced maps and dictionaries, undertook population studies and topographical surveys, classified insects and plants, made seismological and meteorological observations, and studied folklore and native languages. In 1835, his first winter in exile in eastern Siberia, my husband's forebear received a hamper of seeds and tools from Maria. Thanks to her generosity he established himself as a farmer and went on to marry and raise a family.

In October 1983, midway in our assignment in the USSR, Nick and I flew from Moscow to Irkutsk to see what traces we could find of the Decembrists, including Maria and Ekaterina. The flat, monotonous landscape had changed little since the prisoners and their wives had set out along the great Siberian post road. Most of the scraggly little villages dotting the steppes still had unpaved roads that turned into impassable mudholes when the snow melted. Women still lugged water from the well on yokes. Only the TV antennas sticking jauntily from the roofs of the ramshackle wooden houses announced the 20th century.

In Irkutsk we found the homes built by the Volkonskys and the Trubetskoys on a quiet street lined with tired houses whose logs had grown satin-gray with age. The intricately carved doors and window frames spoke of more prosperous days, when Russian artisans were famous for woodwork and the city was called the Paris of the East. Now the two Decembrists' houses are museums to which the Soviet people flock like pilgrims to a shrine. Along the walls of the Volkonsky home (opposite) are copies of poems by Pushkin and others, dedicated to the idealists. There are reproductions of watercolors painted by a Decembrist despite the czar's ban on portraits of the "traitors." And there are bracelets and rings fashioned from the iron fetters of the prisoners, and the heavy iron pot in which Maria and Ekaterina learned to cook.

The guide recited all of Maria's contributions to Irkutsk: the foundling hospital for illegitimate offspring of Russian settlers, the concert hall and theater, the children's choir. But my thoughts turned to Czar Nicholas. Poor Nicholas! If he could see the interest in the Decembrists today, he would turn in his grave.

During the years that Maria and Ekaterina were living in Irkutsk, the czar's world was disintegrating. Even after his death, the full story of the Decembrists was suppressed for fear it would give people dangerous ideas. Lev Tolstoy, unable to gain access to the archives, abandoned the idea of writing a book about the uprising. Instead, he settled for *War and Peace*. After 1917, Lenin rehabilitated the Decembrists, praising them for being the first to strike a blow against tyranny. What he didn't say was that they had wanted free speech, elections and a constitution along American and French lines. The museum guide didn't mention that either, but then, *glasnost* was not yet in place.

Ekaterina's eternal witness to victory

We next went to the Znamensky Monastery, where a number of Decembrists are buried. By the time Alexander II, Nicholas' son, amnestied the rebels in 1856, only 32 remained alive. In the cemetery a crowd was staring silently at Ekaterina's grave. Unlike Maria and some of the other wives, she died before the exiles' amnesty and never went home. Still, as I watched a tourist pay tribute to her with flowers, I realized she had won the great battle against Nicholas. The Decembrists not only triumphed over the czar, they turned the tables on Siberia, which is probably why they are such cult figures in the Soviet Union today.

Ever since the 17th century, when the frigid wastelands of the empire became a dumping ground for convicts and dissidents, "surviving Siberia" has been part of Russia's collective culture. The Decembrists symbolize the victory of the human spirit over oppression. They were brilliant men, willing to give up everything for an idea. But, if truth be known, their triumph was due to a handful of stubborn women who wouldn't take no for an answer.

Ekaterina is buried at the Znamensky Monastery (above), close to Irkutsk, where Maria's house (below) is now a Decembrist museum. Its salon (right) evokes the civilizing influence of the exiles while "surviving Siberia."

By Rudolph Chelminski

Before you take a gift horse home, look in its mouth

Some people are not meant to have a horse around the house. The author is one of them, but his wife is not. Result: chaos reins

I squashed the suspicious little voice inside me that evening a while back when my wife came home with an extraordinary piece of news: we had been offered a gift horse. *Look it in the mouth, look it in the mouth,* squeaked my doppelgänger, or whoever it is that gives advice on occasions like that, but I foolishly paid no attention. "Yes, dear, that's nice," I said, "but where do you intend to put it?"

"Free, absolutely free, no strings attached!" she cried, skillfully evading the issue. "Isn't that wonderful?"

Well, the price was right, there was no doubting that. It was an offer we couldn't refuse. Since then, I have often wondered if King Priam reasoned that way, too, as he peered over the ramparts of Troy and watched the Greeks rolling up that thing on wheels.

So of course we got the horse. He is 20 years old and his name is Eukie. No—strictly speaking, he is supposed to be called Eucalyptus, but since my wife has always been on good terms with the animal kingdom, she rarely stands on convention. After about 15 seconds in her possession, Eucalyptus became Eukie. When her affection is positively overflowing, he becomes Yookie-

"Horsewomanship was upon us. My wife took to wearing goofy pants that puff out on the sides like enormous, misplaced ears, and insisting what a stroke of luck it was that we had a riding stable next door."

Dookie. His coat is brown with splashes of white, and he is 17 hands high. Why equestrians choose to measure in hands is beyond me, but if you're not familiar with the jargon, look at it this way: if Eukie were a shirt, 17 hands would be XL.

My wife is nearly perfect, except that she suffers from the Horse Thing. This relatively well documented affliction causes individuals displaying all the outward signs of normalcy to obsessively risk their lives on horseback when they could be watching football games on TV, playing pool, fishing or reading old copies of *Popular Mechanics*. Many of these individuals happen to be wives.

Youthful passion flooded back

The whole dreadful business began during her childhood in Connecticut, where she had a pony for a while. I had assumed she would have discarded this youthful passion along with her old dolls, but when we left town and moved to the country it all came flooding back, stronger than ever. Horsewomanship was upon us. She took to wearing those goofy pants that puff out on the sides like enormous, misplaced ears, and insisting what a stroke of luck it was that we had a riding stable practically next door.

I know all about riding stables. I have seen them. Their basic function is to breed flies and take the money of people who walk around in helmets and boots and carry whips, pretending not to be terrified. The reason they need all this defensive gear is obvious: to protect them from horses, their sworn enemies.

We didn't need to keep Eukie in a stable. Our second great stroke of luck, my wife announced, was that we already had one. Aha! So *that* was where we would be keeping him—the garage. Of course. Our house being elderly, it has next to it an outbuilding that apparently was used for animals in prehistoric times. In the 20th century it has been put to more civilized purposes: a garage below and me above, in the office I arranged in the attic. Hey, no problem, my wife said, we'll just stack the straw and hay here and the feed bins here and the tack there and Eukie over here. Right?

Right. I backed the car out of the garage, and in clomped the usurper to take its place. Ever since, the car has been rusting out in the rain, I have been living with a four-legged cellmate, and there is a new standard joke among my friends. Every day, several pounds of fresh horse manure is deposited directly beneath the writer's word processor. Ha, ha, very funny.

My office looks like a set for a Western, with trails of hay, straw and oats spread liberally over the carpet where passing feet have deposited them. I now understand why city people used to call country folk "hayseeds." That stuff *clings*.

"Eukie was such an incurably nervous animal that he threw rider after rider, causing *them* to fly."

By now I have learned all there is to know about horses. If you're ready to take notes, I can fill you in on the essentials:

• Horses can fly. It was only after Eukie was safely declared to be our property that we learned he had been a championship-level three-day eventer in his youth. A three-day eventer is a horse that can do dressage (i.e., dance the tango with its rider), do cross-country (the Paul Revere act) and fly. This last discipline, also known as stadium-jumping, was what he was best at, except for one drawback: nobody could stay on him for long. Eukie was such an incurably nervous animal that he threw rider after rider, causing *them* to fly. That was why, after 19 years of fruitless attempts by others to teach him discipline, he had finally percolated down to us.

• Horses burp and stick out their tongues. All day long, my gerundives and adjectival phrases are accompanied by the counterpoint *floop-floop* of Eukie's tongue flopping in and out of his mouth, a habit he punctuates ever and anon with long belches, *urrp-urrrp*, a sound resembling starter motors grinding over.

• Riding is easy, if you listen to the instructors, because all they ever do is repeat one phrase, like a mantra: "Keep your heels down." What they don't tell you is that this is probably the most excruciating position for

Illustrations by John Huehnergarth

"My office looks like a set for a Western—trails of straw and oats spread over the carpet by passing feet."

the human body next to hanging by your thumbs. The most intelligent horse person I ever met is a woman from Maryland who once tried stuffing the back of her boots with cotton, so that the heels would be down while her feet remained comfortably horizontal. The only problem was that she pitched over and fell forward when she dismounted and tried to walk.

• Horses whinny when other horses pass by and whicker when wives approach. There is an essential difference. A whinny is the equine equivalent of a greeting, and it means "Have a nice day, and I hope you throw your rider," while a whicker, a more subdued, chuckling noise, means "Here she comes with the oat bucket, and it's about time."

• Horses have long, black whiskers on their chins and slobber liberally. The slobber is green when they have been eating grass, yellow after carrots, and kind of beige when they've been into hay or straw. They use human beings for napkins, preferably those wearing clean white shirts.

• Horses require new shoes approximately as often as Imelda Marcos, but unlike Imelda Marcos, horses cannot put on their shoes by themselves. They require assistants, known as blacksmiths, for this. A blacksmith is a millionaire who has an ugly dog and strews horseshoe nails in the gravel near my car's tires.

• Horses look extraordinarily graceful when they are galloping by themselves, without a rider, which is the way they prefer to gallop and much the best way to let them do it. Eukie looks especially graceful when he is dodging and wheeling at breakneck speed, whinnying joyfully ("Have a nice day!") and hurling up great clumps of the lawn I have spent 15 years bringing into respectable shape. He is dodging and wheeling because I am trying to catch him.

• Horses are wily. I suspect, in fact, that they might be geniuses. After only a few weeks in the jail we had made for him, Eukie found a way to pick the lock. Somehow or other, he reached over the half-door and undid the latch with his nose. (Try opening a latch with *your* nose sometime.) He ambled out, tore up the garden for a while and then galloped back to his old stable. I installed a new, nose-proof latch.

• Finally, horses are afraid of everything. This is most important. It took me several months to understand the astonishing fact that Eukie, this giant, invincible hippopotamus-in-disguise, was even more afraid of me than I was of him. Among the things that horses are afraid of are burning leaves, grapefruit rinds, handkerchiefs, garbage bags, flashlights, empty cat-food cans, vacuum cleaners, tennis balls, babies, dogs, lawyers and chewing-gum wrappers.

Gradually, the mutual suspicion that Eukie and I shared evolved into something like a satisfactory modus vivendi. I found that if I moved slowly and spoke softly and reverently in his presence, he managed to repress his alarm. As I trudged up to work, I even grew accustomed to that preposterous, big-eared head looming over the wall and stealing great, munchy mouthfuls of the hay stacked on the other side. We tolerated each other. And then what had to happen happened. "Can you take him out tomorrow?" my wife asked casually one evening by the oat bin. The other shoe had finally dropped.

Well, I knew she had to be away that day, but couldn't it just wait? I mean, did these dinosaurs really have to go out and eat trees and knock down houses every single day? Yes, they did.

"There, there," she said. "Eukie's a good old boy,

Rudolph Chelminski, his wife and Eukie live in France. The author last wrote for SMITHSONIAN *on concierges in the January 1991 issue, and on the Danube, July 1990.*

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"These animals fear everything. Among the things that horses are afraid of are burning leaves, handkerchiefs, empty cat-food cans, garbage bags, flashlights, vacuum cleaners, tennis balls, babies, grapefruit rinds, dogs, lawyers and gum wrappers."

aren't you, Yookie-Dookie? Keep your heels down." She patted his withers and his gentle brown eyes gazed straight into mine with silent malice. *I've thrown hundreds better than you. Just try.*

Well, I did, and for a while it went OK. First I had to get him suited up, though. That part didn't go quite so well. Getting a horse ready to throw you is a lot more technical than I had realized.

It begins with the saddle, of course. Very straightforward stuff. All you do is heave it over the horse's back and tighten the belt, or girth. Then comes the bridle. In every horse barn in the world, alas, the bridle is always hanging negligently from a peg on the wall, instead of being attached to a Styrofoam model of a horse's head, as it obviously should be. How else can you possibly figure out where all those loops and straps and buckles and braces are supposed to go?

Once you have calculated all the angles and have a fair idea of what must go where, you are faced with the part you have been dreading all along: putting the bit in the horse's mouth. Grasping the leather thongs like a Malaysian fisherman about to heave a net, I shuffled apologetically up to Eukie and laid the whole mess over his head. It worked fine. His ears slid right through the interstices where they were meant to go, and the side straps hung down by his jaws, ready to be joined with those on the other side. Piece of cake. The only hitch was this: somehow I'd managed it so that now the bit was lying on top of Eukie's nose.

"Steady, big fella," I said, trying to calm myself. Now I knew that the bit had to go in *first*. This time I palmed it the way you do when you give a horse an apple, shoved it up to those slobbery lips, yanked with the other end—and it worked! "You've done this before, haven't you?" I said.

It was when I tried to mount that I realized I had forgotten to knee Eukie in the belly. This sophisticated riding technique is designed to prevent what happened to me at that moment. The saddle slid down as soon as I put my weight in the stirrup. I muscled it back up, stood off, waited till he wasn't looking and gave him a swift one right in the old breadbasket. "Oof!" said Eukie, and before he could say Jack Robinson I tightened the girth two notches. We were ready to ride.

Eukie and I plodded down the lane leading to the woods where the local riding instructors send their victims to do penance. As the minutes passed, my terror turned to mere apprehension and then to something resembling confidence as I sat up there as high as an elephant's eye. Nothing to it. I rattled the reins and talked Eukie into a little trot. Then I made a mistake—I reached for third gear. "How about a little canter, Yookie-Dooks?"

There is some very arcane signal that horse people give their dragons for moving from second to third, and I guess I haven't quite mastered it. All I know is that it involves leaning forward, kicking with one of your heels (or both, maybe—I'm not sure) and reciting

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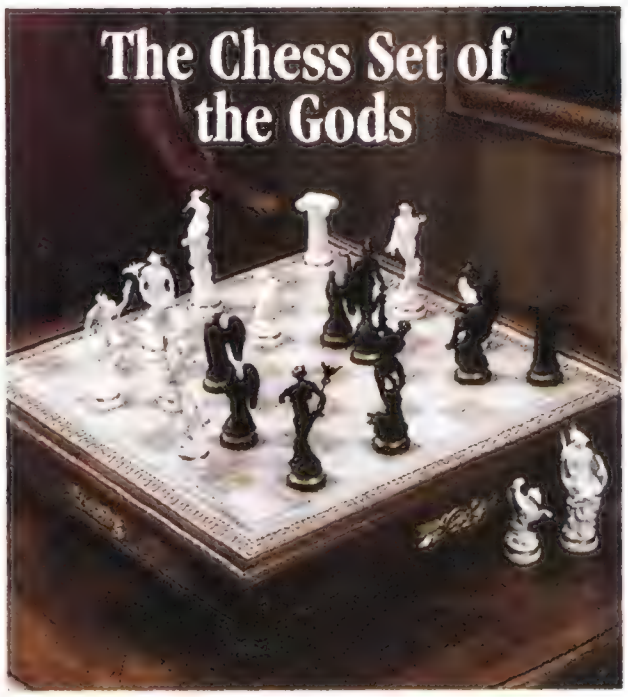

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the Lord's Prayer very rapidly. Apparently I got it wrong, because Eukie reacted in the most astonishing way: he *exploded.*

I don't know why I expected him to just accelerate in a straight line, but I did, and he didn't. Instead, Eukie went straight up into the air, then sideways, as nimble as a five-ton cat, then finally shot forward in a flat-out, ears-back gallop.

For my part, I had already lost most of that ridiculous little saddle and both stirrups with the first jump, and by the time we got straightened out in forward motion again I was placed approximately over his withers, the saddle behind me and Eukie's ears coming up fast. "Whoa!" I cried, just like in the cowboy movies, tugging at the reins and looking for a spot of soft ground where I could bail out.

And you know what? He stopped. All he had to do was shrug one shoulder and I would have gone spinning into the dustbin of history, but Eukie stopped. Either he considered me to be beneath contempt as an adversary, or he decided in that split second that I could carry the oat and water buckets to him much more efficiently if I were alive and in good health.

I *walked* him the rest of the way back.

Ever since, I have cravenly paid mercenaries to come and mount the dragon when my wife can't do it herself. I do, indeed, still carry the oat bucket to him, as he knew I would, and I give him water when he asks for it. Then I return to my attic, tramp through the hayseed and straw, shoo the mice off my keyboard and take my place on the kind of saddle that God meant people to occupy: a big, soft, swivel chair.

Through my window, even now as I type, I can see riders passing by on their way to the forest. Their faces are frozen in terror. "Have a nice day," I mutter as my IBM warms up. "Keep your heels down."

"Eukie reacted astonishingly: he *exploded.* I don't know why I expected him to accelerate in a straight line, but I did and he didn't. He went straight up into the air, then sideways, then he finally shot forward in a flat-out, ears-back gallop."

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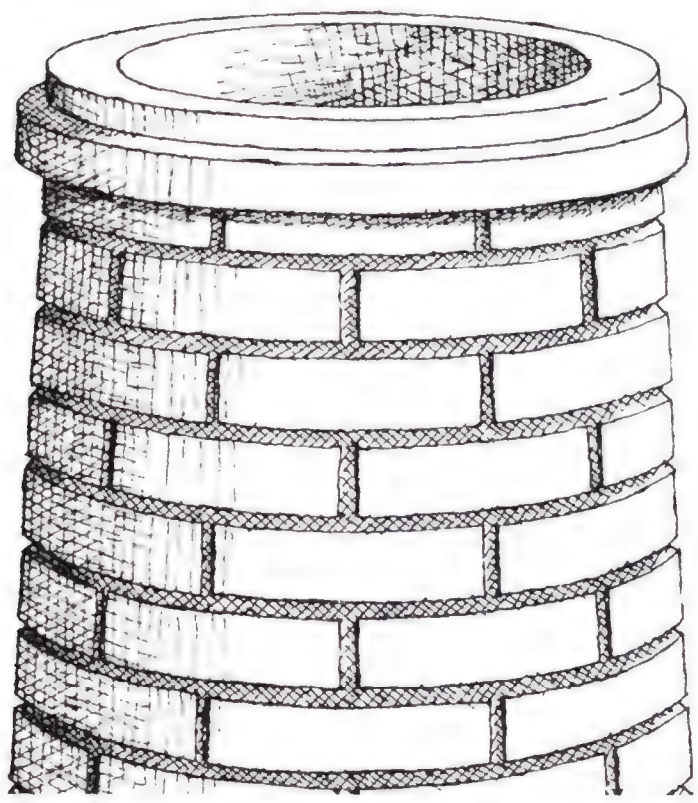

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By Jake Page

A charged particle among the force fields of her times

From her Florentine villa to her Greenwich Village 'evenings' to Taos, Mabel Dodge Luhan caromed among all the movers and shakers

She veered through life like a charged particle among the force fields of her times, flirting with art, radical politics, psychoanalysis, the occult, new things, old things, a causist ecstatically declaring each to be "it." She was a mirror of the men—and women—she devoured, or tried to, an enigmatic magnet drawing luminaries into her orbit for a short spin, delicately setting them clattering against one another, always meddling, a chubby little ion in a life of quantum discontinuities but on a single-minded trajectory of self-invention. She made few bones about it.

Among the many roles she played were: the 20th-century embodiment of the Italian renaissance; a Henry James heroine of supernal sensitivity and self-sacrifice, sadness and swoons; the taciturn Madame de Staël of Greenwich Village; the emergent "New Woman," pressing the hot intellectual buttons of a youthful century, chronicling the times in her magazine articles and the four volumes of her memoirs.

She was Mabel Ganson Evans Dodge Sterne Luhan, married four times and involved throughout her life in numerous affairs with both men and women. Wherever she was, she seemed to be saying, "All right, here I am. What are we all going to do now?"

A product of the stifling atmosphere of late Victorian Buffalo, New York, she took one look at Florence and characteristically claimed it as her city. She ogled the mountainous Gertrude Stein with more than literary appreciation; got a New York shrink to fire her second husband for her; served as self-appointed muse for the boyish poet-turned-Red, John Reed; set out to save Indian culture; met her match in the soul-collecting business in the boyish scandalizer D. H. Lawrence; and, while admitting a temporary defeat, recovered the initiative for one mad moment when she tried to steal his ashes from the New Mexico chapel his domineering wife, Frieda, had erected. People were the bric-a-brac of Mabel's interior design.

She was generous to a fault and as self-absorbed as a black hole. She was astonishingly attractive to a kaleidoscopic pantheon of memorable and more accomplished men and women. Said Clifton Fadiman: "You can't explain Mabel in a phrase. She's a poser, right enough, and any way you define the word is OK with me." Muckraker Lincoln Steffens defined her as a hetaera, and Mabel *loved* the idea of that. "Hetaera": "a concubine"—which she was in fact for only a few short periods, since she tended to marry the men she had thoroughgoing affairs with. The word also means a woman who uses her beauty and charm to amass wealth and power. But Mabel already had wealth; her mother (whom she professed to detest) kept her well-heeled, some people thinking she was a millionaire in her own right.

Power is what she sought, and she dominated those who met her needs. In the third volume of her memoirs, entitled *Movers and Shakers*, she listed those she befriended during her New York City years: socialists, trade unionists, anarchists, suffragists, birth controllists, poets, lawyers, murderers, psychoanalysts, Wobblies, single-taxers, journalists, artists, seers, government officials. She listened to them all, mixing them up, creating what we might call synergy. She sought to be a "culture carrier," in D. H. Lawrence's terminology; she thought of herself as a passive "channel" for greatness, a listener, but everyone knew she was active to the point of meddling.

An endless search for understanding

"I wanted," Mabel said in an interview, "to try and free more than speech—I wanted to try and loosen up thought by means of speech, to get at the truth at the bottom of people and let it out so that there would be understanding. Understanding! That's the one thing men go on trying for through all the changes in the world, quarrying it out of one material or another as time passes."

Gertrude Stein, then unknown in America, would visit Mabel in her Florentine villa while seeking to write words the way Picasso painted: verbal Cubism. On one of her visits Gertrude wrote "The Portrait of Mabel Dodge at the Villa Curonia," which cubistically mentioned neither Mabel nor the villa, but dwelt a bit on heavy breathing, which Gertrude no doubt heard

Not a beauty, Mabel was an intelligent listener, as captured in this portrait by Mary Foote, circa 1915; during this tumultuous era, her weekly New York salon was highly influential for the airing of new ideas.

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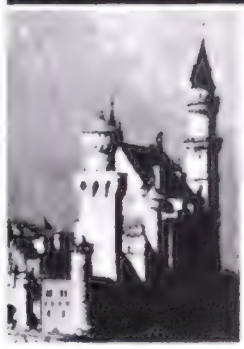

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Mabel, a widow with a young son, met Boston architect Edwin Dodge, her second husband, while sailing to Paris in 1904. They soon settled in Florence.

from the next bedroom while Mabel carried on a passionate flirtation with her own son's young tutor, pleading adoration. But there was power in withholding ultimate favors. Mabel was what we would call a tease; she knew how to read people and court them for a purpose. Mabel loved Stein's prose portrait, among the first of many portraits that would be done of her. In return, she introduced Gertrude's work to an American public reeling from the explosion of avant-garde art at the Armory Show where, among other things, Duchamp's nude descended the staircase into a world that would never be the same. "*I* was going to dynamite New York," Mabel would later write of the Armory Show, in which she played a role by obtaining works, funding and promotion, "and nothing would stop me. . . ."

Around that time, in January of 1913, Mabel wrote to Gertrude, still in Europe, to tell her how excited the world (read "New York City") was about Gertrude's abstract prose portrait, and thanked her because now Mabel's mail was addressed to Mrs. Mabel Dodge, not Mrs. Edwin Dodge. Mrs. Mabel Dodge had set up residence at 23 Fifth Avenue, just a few blocks below the northern rim of Greenwich Village, which itself was suddenly becoming a real community after decades of being the vague center of a vast and amorphous collection of people who were out of sympathy with the prevailing mores of America.

Now America needed total renovation, a renovation that would arise from the intellectuals and artists and radicals who flocked to the Village, with its magazine, *The Masses*, mouthpiece of bohemia, and with the Liberal Club, gaboteria for the renovators newly moved downtown from Gramercy Park to rooms above a restaurant on Macdougal Street. And, of course, the salon at Mrs. Mabel Dodge's house that came to be known as her "evenings," what Lincoln Steffens had called "the only successful salon I have ever seen in America."

Not on the envelope any longer was Edwin Dodge, a Boston architect who

had run into Mabel Evans aboard ship the night before she arrived in Paris, in 1904. Fleeing from Buffalo at age 25, she was a widow with a small son. Edwin swept Mabel off her feet. They married that year, and before long found themselves ensconced in the palatial Florentine villa where Mabel would seek to turn life into art.

Her bedroom had a silken ladder that descended from a trapdoor in Edwin's room to her luxurious and ornate bed. Edwin, no swashbuckler, used it but once and then only to see if it worked. Mabel decided early on that Edwin was not introspective, not sensitive, and it seems that he wasn't. Only after months of marriage did he tell Mabel that he had just realized she was short. This threw Mabel into a funk: it spoiled her act. She thought she might no longer be able to dominate him. He came and went on architectural jobs while she decorated her villa with superb art, agreeing with her occasional visitor, Bernard Berenson, about the notion of art for art's sake, art over all, art *as* all, and

As a teenager in Buffalo, New York, Mabel was viewed as too high-spirited.

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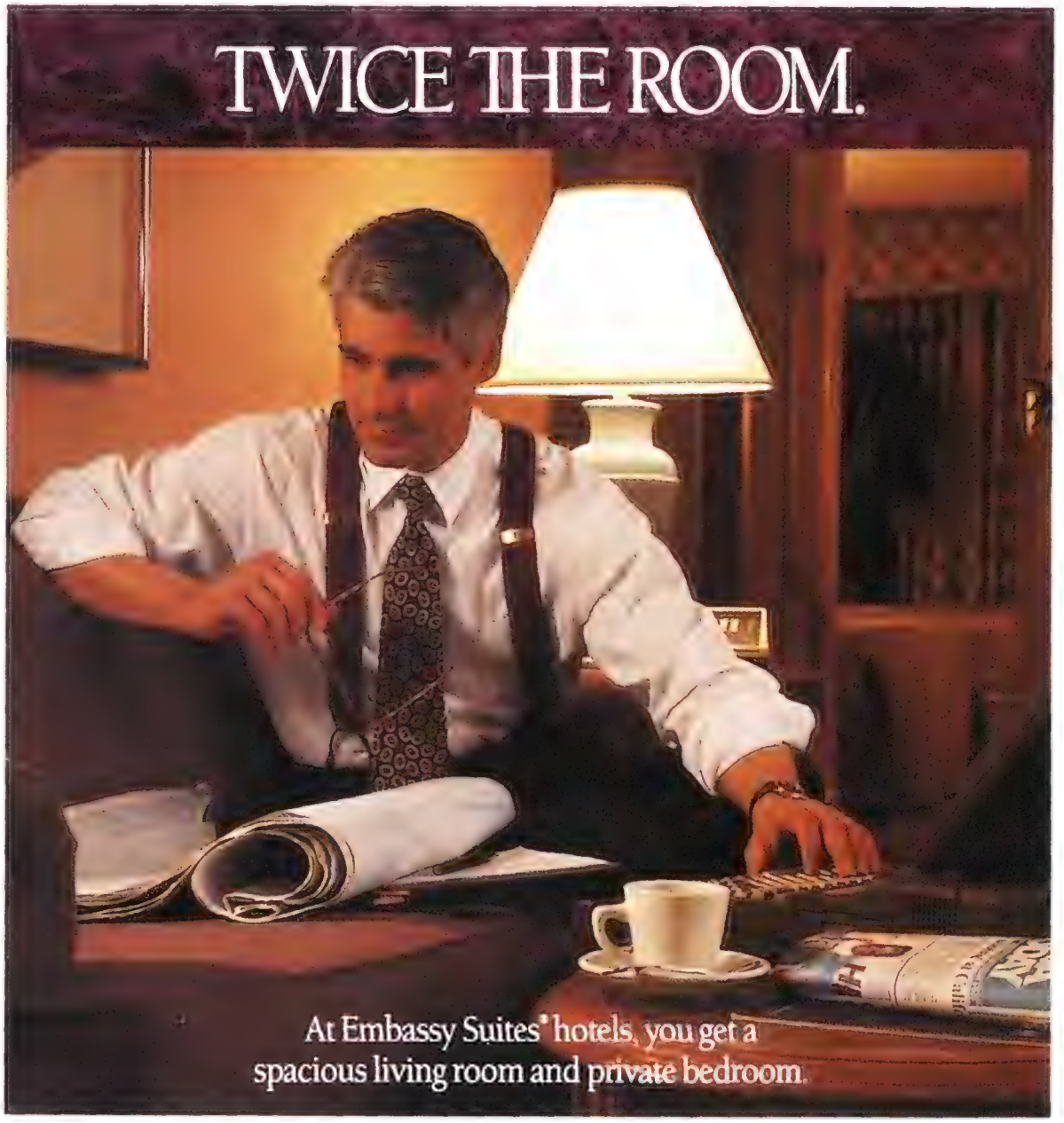

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Mabel introduced Gertrude Stein to the U.S. public through magazine articles.

(said one Italian acquaintance) exercised "a rich and joyous imagination which turned her life into something nearing poetry."

Having designed a magnificent set, she found her role obscure. She began to collect people, famous ones: the great actress Eleonora Duse, Artur Rubinstein, André Gide, Lord and Lady Acton. She commissioned a French portraitist to paint her in elaborate costumes—turbaned ballet performer, Renaissance woman, in country girl dress, holding a basket of eggs. She found a local youth, a reminder to her of a Florentine painting, hired him as her chauffeur, fantasized about his royal ancestry (Austrian-Tuscan, no doubt) and led him on to the brink of passion, withholding the final fruits, of course, whipping herself into such an emotional frenzy that she attempted suicide twice.

Then Gertrude Stein arrived, giving Mabel the courage to believe that one could remake oneself by an act of artistic will, proving the point with her prose portrait. Gertrude's brother, Leo, also a regular visitor to the villa and an early supporter of Picasso and others in the avant-garde camp, couldn't understand the portrait, saying, "I feel that I am not exceeding my reasonable privilege in thinking it damned nonsense."

Leo contributed his own portrait:

> Mabel Dodge
> Hodge Podge.
> What is up,
> What is down,
> What's a smile,
> What's a frown,
> . . . . . .
> Wound too tight,
> All run down.
> High, low, Jack and the game,
> Burning ice and freezing flame,
> Half is brisk and half is lame,
> Some is wild and some is tame.
> Whistle and creek,
> Florid and bleak
> Hodge Podge
> Mabel Dodge.

Oddly, Mabel would eventually fall out with Gertrude Stein, but brother Leo would remain a staunch if distant friend for decades.

In any event, partly because Europe was not fulfilling for someone who had come to see herself as essentially an embodiment of the new American, and partly because her son was old enough to require formal schooling, Mabel returned to America in the fall of 1912. This was an America whose basic mores would be summed up a decade later by Sinclair Lewis' novels *Main Street* and *Babbitt*. Almost immediately, Mabel found herself (via the Stein portrait and her hustling of it, along with her role in the Armory Show) in the thick of an intellectual and artistic upheaval, a virtual lifetime of heady new causes. And she, by her own account, was by then an accomplished hunter of heads.

At the heart of the ferment lay the idea of liberation—liberation of the masses (whether they were ready for it or not), liberation of the artistic consciousness, liberation of the sensual self from the shackles of a previous century, liberation of the soul from

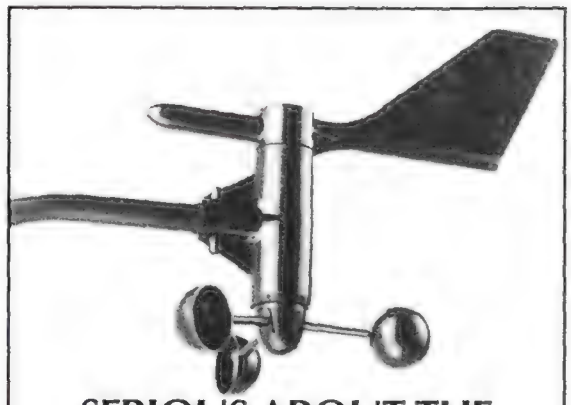
A frequent contributor to these pages, Jake Page wrote on starlings in the September 1990 issue of SMITHSONIAN.

the increasing mechanization and impersonalization of life in an America about to take its place on the world scene. Freudianism needed to be championed, and Mabel, writing in newspapers, popularized psychoanalytic theory.

Before long Mabel's evenings had begun. People simply showed up; they ranged politically from anarchist Emma Goldman to left-leaning Walter Lippmann, fresh out of Harvard. "Big Bill" Haywood, head of the Industrial Workers of the World, the Wobblies, would hold forth to resentful and recently established artists on the need for a proletariat (and by implication, anonymous) art. A poetry evening with such notables as Edwin Arlington Robinson got out of hand, and Amy Lowell stalked out. Lincoln Steffens, the original muckraker but for some years now something of a has-been, was ecstatic: "I'm being listened to again!" he exclaimed. "I'm expected to be radical now, so I'm free of the incubus of caution."

It was Mabel's own laboratory for a new world order, and it soon became quite famous. Said Steffens, "Men like to sit with you and talk to themselves. You make them think more fluently, and they feel enhanced." Up to a

One of Mabel's many passionate affairs was with young firebrand John Reed.



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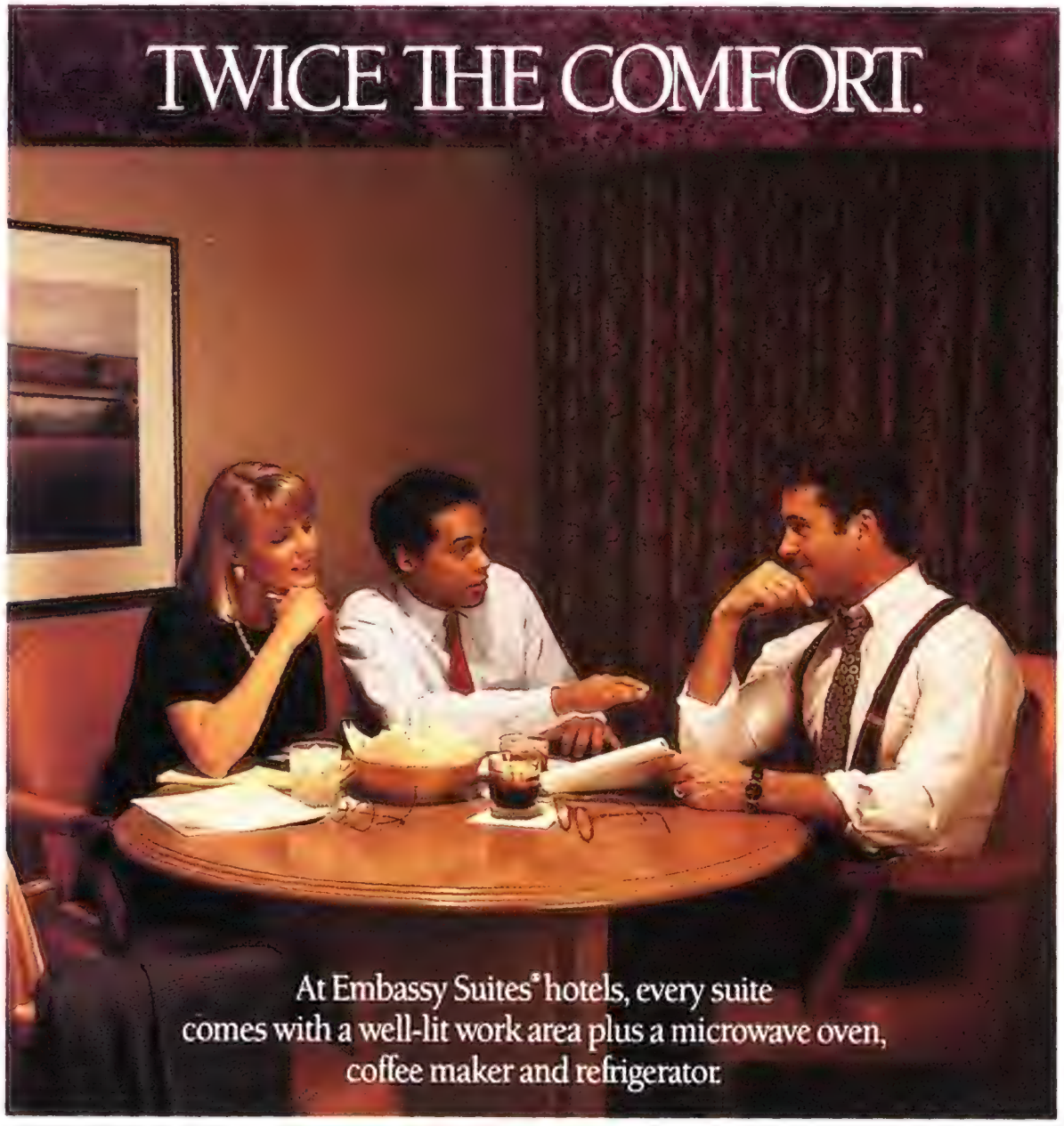
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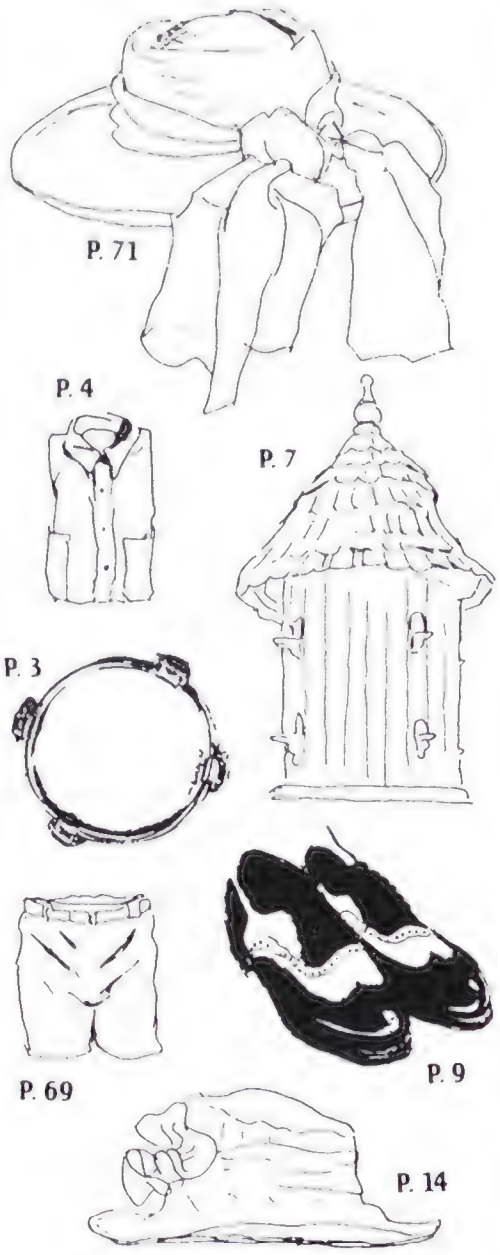

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Tony Luhan, a Tiwa Indian from Taos, was Mabel's fourth and last husband.

hundred people might show up on a given evening, dressed in dinner clothes or denim, finery and jewels or sandals and ethnic costume. Dressed in a flowing white gown (her apartment was painted white), Mabel met them all at the door, gave each guest her hand and smiled in a detached way—a Mona Lisa smile, as Artur Rubinstein once described it. And the talk would begin—starting with a topic or theme picked by Mabel—and carry on into the night, sometimes even after a buffet dinner was served at midnight.

"Probably," historian Oscar Cargill later observed, "there had never been such a mingling of art, sex, politics, spiritualism, cold meats, and lettuce sandwiches."

Several months after the first evening, Mabel was interviewed by a New York reporter and expressed her belief that the printed page would soon be superseded by the spoken word ("recorded on the air with a kind of terrible permanence that we do not even dream of") as the chief medium for the new consciousness, for the testing of new ideologies that would lead to a new world order.

In spite of this McLuhanesque comment (made seven years before the first commercial radio broadcast, never mind television), all her life Mabel assiduously kept a diary, which became her memoirs. Meanwhile the evenings gained a national reputation. A young woman who would one day be wife of Yale's president wasn't sure it was the right thing to do but went anyway.

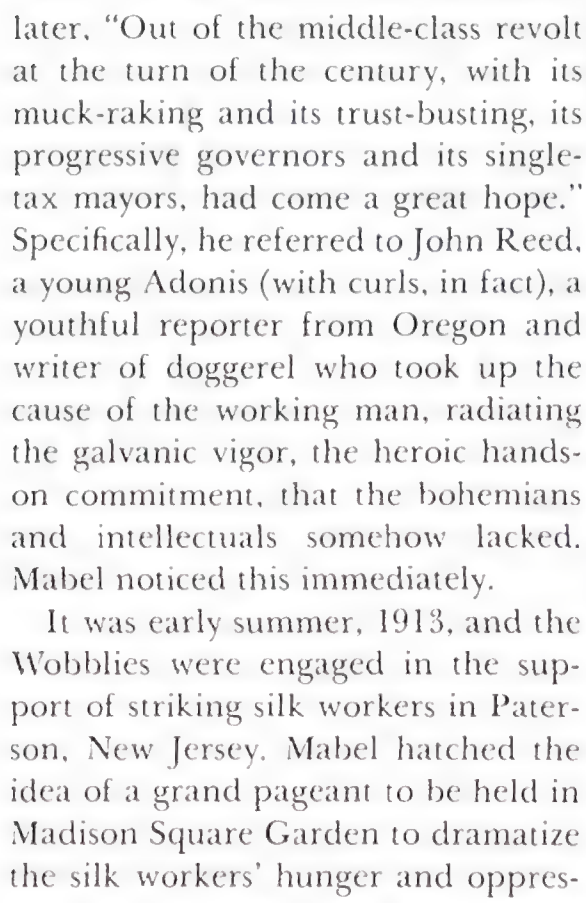
It was called "the Lyrical Left" by one commentator, and there was a certain gaiety to it all, the fine bohemian mix of radical politics, art and sexual revolution. And it is a bit easy to make light of it—for example, the night an anthropologist fresh back from Indian country got everyone stoned on an unheard-of cactus button called peyote, to the outrage of Mabel, who retired early, leaving the evening to the slow beating of a drum.

But it was not exactly what we think of as radical chic: there was cross-fertilization of ideas with a fierceness. Political theory would meet psychology, for example; art would meet psychoanalysis. There was a "parade of ideas and feelings," said one commentator, "the display of which counted for more than clarity or precision of expression." People there were serious about their ideas—Margaret Sanger had been to jail for her fight to give birth-control information to poor women, and Walter Lippmann, Max Eastman and other attendees espoused ideas that would become the major trends in much of American intellectual life in the years to come.

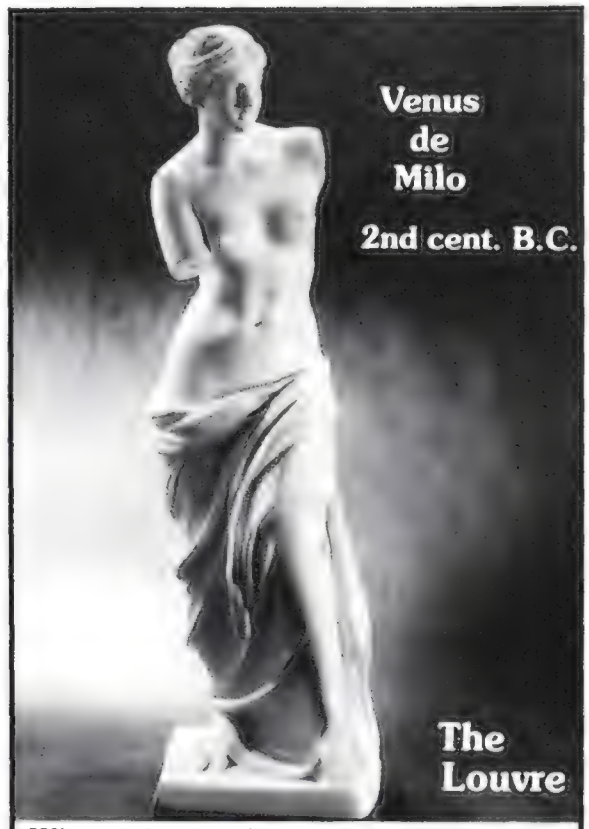
American society still wrestles with many of the issues noised at 23 Fifth Avenue. Mabel, the listener, the catalyst, espoused none of these causes since to espouse any cause was to dismiss another. Beyond the evenings, she generously supported artists, sending an innovative stage designer to Zurich to be analyzed by Carl Jung. She backed what Steffens called "trouble-lovers" in free-speech demonstrations and rallies for striking laborers, once selling off her dining room chairs to post bond for a bunch of Socialists.

And then, wrote Granville Hicks later, "Out of the middle-class revolt at the turn of the century, with its muck-raking and its trust-busting, its progressive governors and its single-tax mayors, had come a great hope." Specifically, he referred to John Reed, a young Adonis (with curls, in fact), a youthful reporter from Oregon and writer of doggerel who took up the cause of the working man, radiating the galvanic vigor, the heroic hands-on commitment, that the bohemians and intellectuals somehow lacked. Mabel noticed this immediately.

It was early summer, 1913, and the Wobblies were engaged in the support of striking silk workers in Paterson, New Jersey. Mabel hatched the idea of a grand pageant to be held in Madison Square Garden to dramatize the silk workers' hunger and oppression by the police. John Reed volunteered to write the pageant, and the sultry looks that the two exchanged on the spot forecast an affair that would become a Village legend. While others labored on production details, Mabel took her role to be the inspi-



D. H. Lawrence modeled the heroine's life in *The Plumed Serpent* on Mabel's.



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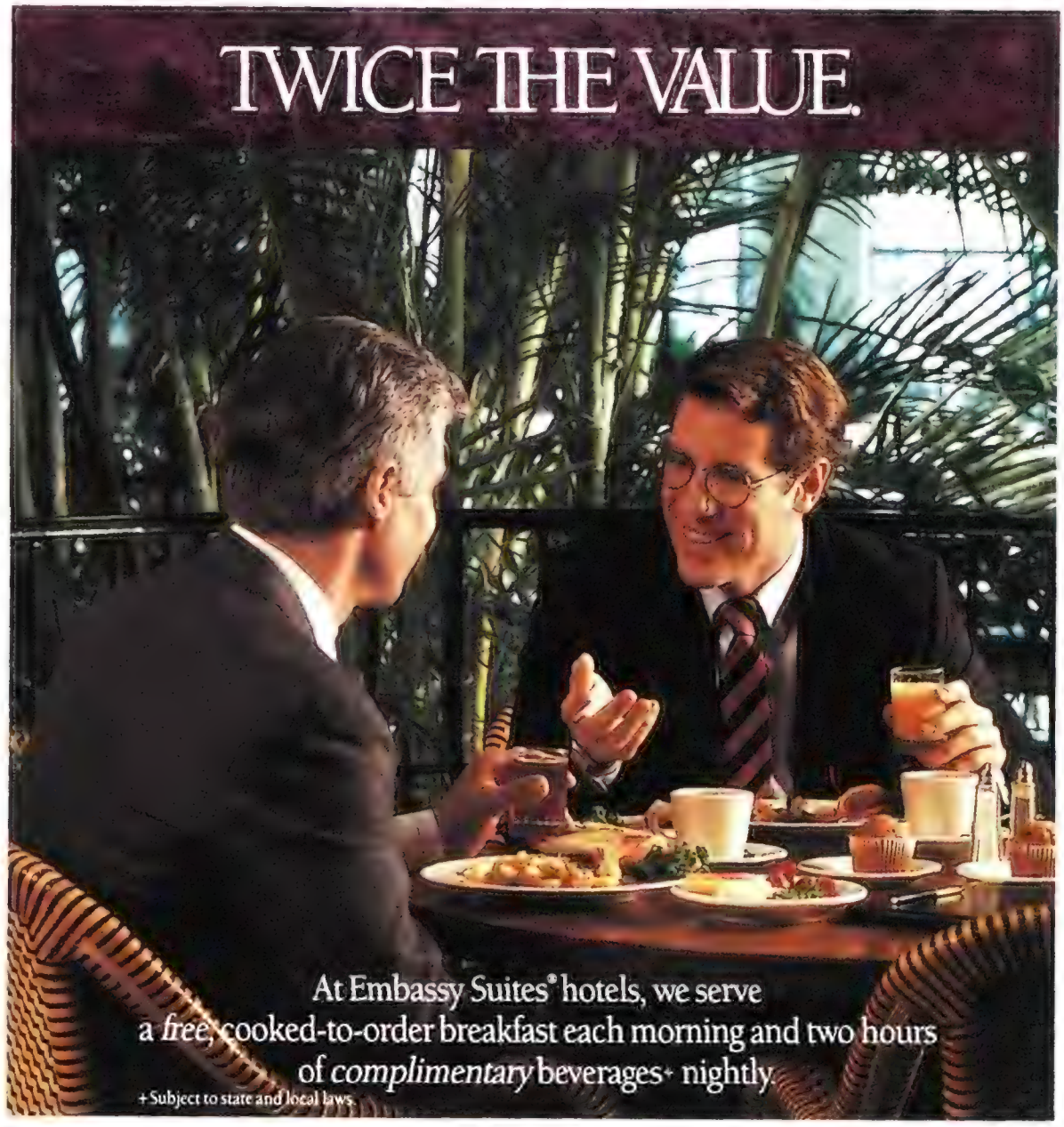
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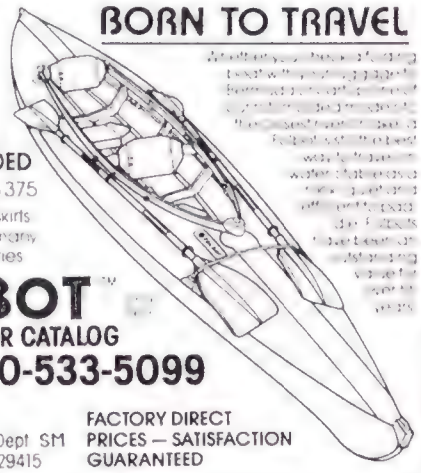

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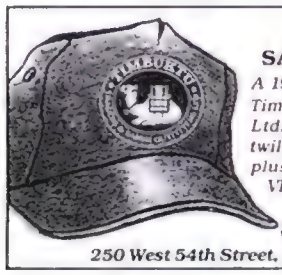

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ration for Reed, and love's flames grew. However, even after the pageant (which was considered a great success) and on board a steamer to Europe, Mabel withheld her favors from an increasingly importunate young Reed (at 28, he was six years her junior) until they reached a Paris hotel.

Mabel was totally obsessed with Reed, jealous even of the attention he might pay an objet d'art, and in turn tried to possess him totally—in order, of course, to mold his inchoate talents into greatness. Meanwhile, though captivated, he wasn't about to let his outside interests be captive to his passion for Mabel. After a few months' stay at Mabel's villa in Florence (Reed usually used the silken ladder at night), Reed moved into 23 Fifth Avenue, with Mabel complaining that she had to "recapture" him every night only to lose him every morning to his patrols of the ghettos.

The affair was doomed, but it dragged on for more than another year amid moments of despair and exaltation, while the Village looked on with awe. Here indeed was the New Woman, living openly with her lover, reveling in the limelight. But in November 1913, Reed left, saying that

In Taos, Mabel and Tony settled into a small adobe on 12 acres, adding to it until it eventually had 17 rooms topped by a Florence-influenced dovecote.

A prim D. H. Lawrence painted Mabel's uncovered bathroom windows at Taos.

he was suffocating, even though he loved Mabel. Mabel took an overdose of veronal but survived. Reed was persuaded by mutual friends to rejoin her. Then Reed went off to interview Pancho Villa, and Mabel, at the last moment, decided to accompany him, going as far as El Paso. But with nothing there for her to do, she returned to New York. In due course, Reed returned, something of a hero, and Mabel devoted an entire evening to his views of Mexico. But she came to resent his growth and accomplishments: she was attracted by his youthful vitality but also wanted to consider him something of a child—her child. He wrote to her: "You are so beautiful to me for just that soul of yours, and so alive. You are my life."

Mabel sensed otherwise and began to withdraw that soul of hers. The affair continued nonetheless; Reed went to Europe to cover the beginnings of the war and came home several times to Mabel, who finally flung him out, Reed stalking off into the darkness. The curly-haired Adonis, to whom Mabel had so fanatically tried to play Galatea, went on to achieve glory covering the Russian Revolution, got married, and in 1920 died of typhus while serving the nascent Communist Party in Russia. Mabel would later claim that his reported deathbed words were clearly meant for her: "Listen . . . I am singing a little song for you. . . . The whole world came between us. . . ."

But in saying goodbye to Reed "in

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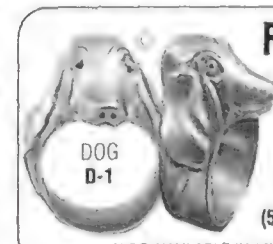

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my heart" in 1915, Mabel also said goodbye to much else. "My young lover was gone, and, it seemed, gone with him were the younger hopes of change." She turned to nature and art. For a time, she worked with Isadora Duncan, whose freewheeling philosophy of dance seemed to bespeak the natural woman unfettered by any and all male considerations. The evenings dwindled and Mabel spent a great deal of time out of the city, in Croton-on-Hudson, New York, a burgeoning art center, where she got tangled up with a Russian-born painter named Maurice Sterne. Sterne was especially drawn to Mabel's voice, "like a viola, soft, caressing, mellow, with confidential overtones."

In any event, the down-and-out Sterne was rather cynically in search of a patron, and Mabel seemed to need a man on whom she could vent her frustration with men in general. A more or less clandestine affair followed, and then a hasty wedding, her third, right after which Mabel sent Sterne off to the Southwest by himself. Feminists were disappointed, even angry, with Mabel for succumbing to the outmoded propriety of marriage.

In New York, Mabel was busy, writing a syndicated column on contemporary issues for the *New York Journal*, seeing a psychoanalyst and dabbling with a fad called Mind Cure. But she was clearly adrift, a particle about to make a quantum leap. Then a medium saw her soon to be surrounded by Indians. One night in bed, Mabel had a vision in which she saw Maurice's face transform into that of an Indian. Shortly thereafter, she received a letter from Maurice that said: "Do you want an object in life? Save the Indians, their art-culture—reveal it to the world!" And so Mabel wound up in Taos, New Mexico.

In 1940, Edna Fergusson wrote of the arid Southwest, "Those who can stand it have had to learn that man does not modify this country; it transforms him, deeply. . . . It is magnificence forever rewarding to a man courageous enough to seek renewal of his soul." Arriving in New Mexico in 1917, only five years after it had become a state of the Union, Mabel Sterne was captivated by the place and sought a renewal of her soul. In the transformation business, however, between New Mexico and Mabel, it proved to be a bit of a standoff.

She quickly came to see the inhabitants of the ancient pueblo of Taos as the embodiment of what America needed for redemption—an organic blending of nature and art, community and ego, an antidote to the overall decay of her society and the feckless argumentation of the Village she had left. She proselytized these newfound values relentlessly for the rest of her life, drawing a continuing stream of important visitors to the

The style and performance of the Accord. Plus the spaciousness of a wagon, a more powerful engine, and

house she eventually built, a strange mix of pueblo architecture and Florentine flourishes (p. 130). She brought a social worker, John Collier, to New Mexico, persuading him that Indian cultures were not dying, not merely awaiting a dignified death, as he then thought. Instead, they needed allies, and while Mabel helped whip up enthusiasm in the nation for the Indian cause, Collier went on to become the Commissioner of Indian Affairs. His work to pass and implement the Indian Reorganization Act of 1934 is arguably one reason why Indian cultures are still among us.

Of course Mabel had her own spin on such things: when the Taos Pueblo elected to bring running water into its premises, Mabel was disgusted, loving the picturesque sight of Indian women bearing water in clay urns. She also objected vigorously when the Native American Church brought the use of peyote to the pueblo. Meanwhile she had dumped her third husband, Maurice Sterne, cutting off his $100-per-month stipend, and had married a large and stolid Taos Indian, Tony Luhan, guaranteeing his former wife $35 a month for life.

The well known streamed out to enjoy Mabel's offer to discover the redemptive climate and cultures of New Mexico: Mary Austin, who settled in Santa Fe and competed with Mabel as culture carrier; Thornton Wilder, the playwright; Ansel Adams, a young musician and photographer who, upon seeing Taos, redirected his life to the photography of the West; Georgia O'Keeffe, whose suggestive paintings had jarred the new Mabel and with whom both Mabel and Tony had brief affairs. O'Keeffe came and went, then eventually returned, the rest being art history. Mabel attracted lesser-known artists to join those already there, and hustled their work, the designated doyenne of what some (including Mabel) thought the major art center in America, though many did not agree. The grumpy critic Edmund Wilson visited in the 1930s, finding the state's landscapes and small towns attractive but pronouncing its artistic colony "about the worst set of artists and writers to be found anywhere."

Her most stunning capture—and loss—was D. H. Lawrence, whose *Sons and Lovers* had convinced her that he and he alone could portray the redemptive truth about her adopted locale. She determined that he would "take *my* experience, *my* material, *my* Taos, and . . . formulate it all into a magnificent creation." In fact, she expected Lawrence to produce nothing less than the great American novel, with Mabel as heroine. For she was beginning to see that her personal evolution mirrored the flowering of a new utopian ideal.

Lawrence arrived in 1922, and

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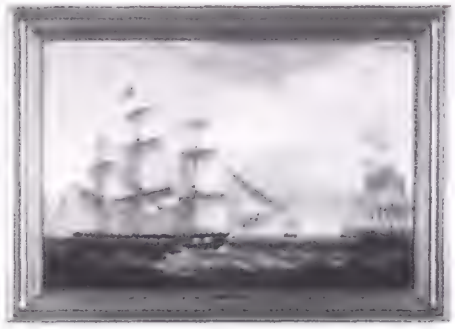

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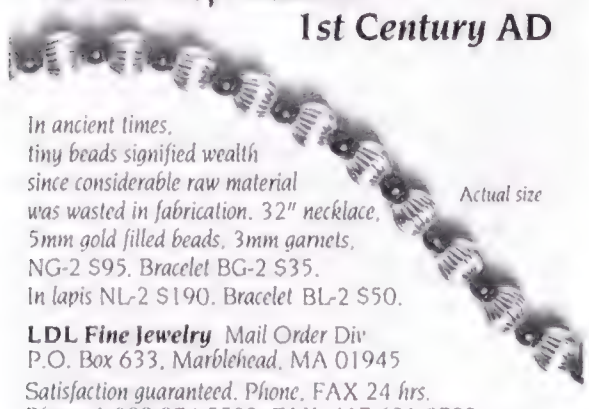

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while Mabel immediately began a hopeless competition with Lawrence's wife, Frieda, for Lawrence's soul, she had little trouble in persuading him to start the great American novel. In it Mabel was to be called Sybil Monde, a powerful symbol of the "eternal feminine," sharing the symbolic spotlight with the New Mexican landscape and (as a rather anachronistic example of American mechanization) the railroad train.

It was a time of strange conflicts and curious revelations of character. Mabel's house was surmounted by a bathroom with windows on three sides. Lawrence, whose explicit love scenes in *Women in Love* had been attacked by the British press, was scandalized by the lack of privacy and painted whimsical if crude designs on all the windowpanes. He was equally scandalized, this man devoted to the natural, who would write *Lady Chatterley's Lover* within the decade, when Mabel, wrapped in nothing but a burnoose, summoned him to a meeting with her on the roof.

What with the ensuing feuds between the two women, scenes, reconciliations, Lawrence's distaste for Indians and a developing fear of the overwhelming landscape around him, Lawrence wrote only six pages of the novel and wound up, temporarily at least, a misogynist. His falling out with Mabel was permanent. However contradictorily, Lawrence did write pieces in favor of the preservation of Indian culture, and a few other impressions of the state, and his works—including *The Plumed Serpent*, a novel of Mexico that was something like the one Mabel wanted him to do about Taos—remain popular in New Mexico.

After all the Sturm und Drang of the Lawrence period, Mabel remained obsessed with the idea of finding the right man to "give a voice to this speechless land," and she next fixed on Robinson Jeffers, the wild poet of Big Sur myth and nature who, like the Greeks of old, saw women to be the fundament of evil, an evil that had to be reckoned with for life to be successful.

Mabel enticed Jeffers to Taos by persuading him that his sons would enjoy a summer in New Mexico, and then withholding the invitation until Jeffers and his wife, Una, agreed to

Mabel and Frieda Lawrence (with artist Dorothy Brett), "New Women" of 1920s, were infrequent pals, competing fiercely for D. H. Lawrence's attention.

Photograph of Mabel on horseback at Taos home was taken in 1930s by her psychotherapist Dr. A. A. Brill, who was the first to suggest that she write.

come too. Mabel told Jeffers that, since her failure with Lawrence, she had become a "clearer channel."

The Jeffers family wound up visiting Taos often. Una wrote that Mabel Luhan was the most interesting woman she had met in years. There was a bit of a falling out when Mabel engineered a flirtation between Jeffers and another visitor, and Una attempted suicide, but things eventually got patched up to everyone's satisfaction—except that Jeffers never became Taos' poet laureate. He wrote but one poem about New Mexico, which included the lines: "And certainly there was never religion enough, nor beauty nor / poetry here . . . to fill Americans."

As the years passed, Mabel's efforts became increasingly local (she took the lead, for instance, in building a hospital in Taos, and continued to support the arts and local artists) and she was largely forgotten outside New Mexico, where she was honored by such terms as "regent" of the state. Her life settled down to a quiet routine in her big house next door to the Taos Pueblo lands. During these years, beginning in the 1930s, she wrote several books, most notably her memoirs and *Winter in Taos*, which was highly praised by Thornton Wilder, Willa Cather and many critics.

Edmund Wilson quoted a visitor's description of life at home in Mabel's house: "Tony would stretch his legs and go to sleep after dinner—wearing the smartest and most perfect English riding boots and pants and sometimes a button of his fly would get caught back so that it would show—while Mabel would sit there sewing and talking about the decadence and disintegration of the Anglo-Saxon race—those were the words most often on her lips."

Life quieted down. People visited, but no one famous. In 1962 Mabel died and was buried in the Kit Carson Cemetery in Taos—another contradiction in a lifetime of contradictions. When Kit Carson Park was established in the 1950s, the board had voted her the honor of a final resting place near the famed killer of Indians.

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Mabel called her lawyer and said, "I hate Kit Carson." Later she acceded to the idea. Tony, who died a year later, was buried at Taos Pueblo.

Mabel has been called many things during and after her lifetime, from feminist paragon and catalyst for great minds to witch and worse. She was all of that, to be sure, and more—and less. She was, finally, Mabel, an original. As the man said, you can't define Mabel in a phrase.

Mabel's big house in Taos, which has been restored, is listed on the National Register of Historic Places. It is often used for the modern equivalent of the salon—cross-disciplinary seminars and workshops. The only problem is that Mabel isn't sitting there, listening, somehow by her inexplicable presence making people "think more fluently," making them "feel enhanced." She isn't even up on the roof in a burnoose, meddling.

After a life of wild adventures, Mabel found peace in Taos, where she lived until her death in 1962, writing books and four volumes of memoirs.

Book reviews

Red Oaks & Black Birches: The Science and Lore of Trees
Rebecca Rupp
Garden Way, $10.95

Roy C. Sullivan, a retired Shenandoah park ranger, holds the dubious record of having been struck by lightning the most times ever recorded—seven—and living to tell the tale. In *Red Oaks & Black Birches*, Rebecca Rupp advises us, "Other than in Mr. Sullivan's boots, perhaps the worst place to be during an electrical storm is under an oak tree."

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Unlike many books about trees, which are repetitious and make perusal a chore, *Red Oaks* is immensely readable. Rupp bounces from subject to subject, or tree to tree, with the grace and natural agility of a gray squirrel that just happens to have a library of interesting facts and arcana stowed away in a hollow trunk.

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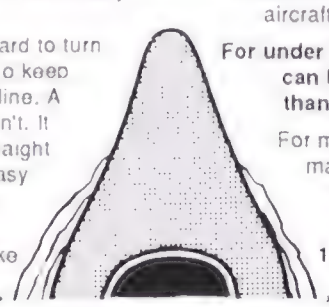

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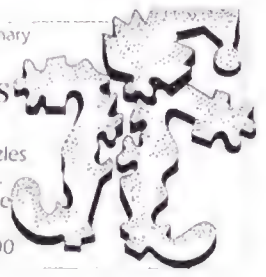

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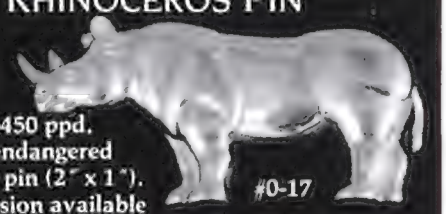

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ica. Each gets a chapter, often with references to arboreal relatives around the globe. The species run from oak to legendary redwood, and from weeping willow to medicinal sassafras. Each chapter is leafed out, so to speak, with references to folklore, politics, literature and utility. Rupp's training as a scientist serves her well: the explanations of botanical processes are absorbing and clear.

Rupp does touch briefly on the loss of great stretches of America's vast forests, which blanketed the nation when the first pioneers arrived. By the 1790s, she writes, "ax-happy settlers, surrounded by what looked like limitless woods," had put such a dent in the landscape that Revolutionary-era conservationists called for forest preserves.

At its core, however, *Red Oaks & Black Birches* celebrates the diversity and wonder of what survives, and makes a reader keenly aware of how entwined with its woods America is—historically, economically, environmentally. It left me wondering, with the author, why everyone doesn't get Arbor Day off.

Joe Sherman
Vermont writer

The Wake of the Unseen Object
Tom Kizzia
Henry Holt, $19.95

A boatful of native Alaskans slapping downriver through the chop on their way to the biggest softball game of the season. A hunter singing the old songs for hunting luck, as he snowmobiles onto the ice with his rifle. Such contrasts—Eskimo and outsider, ancient and modern—run through Tom Kizzia's chronicle of travels in the Alaska bush in search of "ancestral landscapes."

Kizzia's editors at the *Anchorage Daily News* agreed to sponsor his quest and gave him two years in which to accomplish it. The only rule—his own—was to visit "places I couldn't drive to from Anchorage."

Realizing that he might be searching for a chimera—"Even in the continent's last wilderness, I knew, there might be nothing to see of the earlier world except its vanishing wake"—he nevertheless decides to have a look.

What he finds is contrast. Tension and balance. In some places, old and new, Native (the capital *N*, the author tells us, is a "typographic clue," distinguishing indigenous peoples from descendants of pioneers) and newcomer have found a workable balance. Elsewhere, the tension is still unresolved.

As he goes from village to village and, more often than not, finds himself welcomed, Kizzia gives us some memorable descriptions. The Copper River is the "color of iced cappuccino, wide and swift and frothy"; as the sun sinks beyond the Bering Strait, land and water brighten like "stained glass filling with light"; he looks at mountains and sees a "line of rocky gargoyles" guarding a ridge.

What Kizzia has recounted is his very personal journey, his own effort to make peace between the yearning for wilderness and isolation, and the need to earn a living and be a part of today. Along the way he collects the stories of old-timers; finds new insights, experiences frustration and exhilaration. Generously, he shares them with us.

One day he does the grueling work of salmon fishermen, catching fish to sell to a Japanese processor. Another day he leaps at the chance to participate in one village's beluga whale hunt. "As we gathered equipment I barely had time to think that I might regret this. Killing a whale was not high on my list of lifetime goals. Whales had always seemed noble, graceful creatures. . . ." In the course of the chase he begins to see in the hunters a similar feeling. "When the Eskimo said he was going to 'catch' a whale, he chose the verb . . . as a translation of the customary belief that an animal's spirit passes on after giving its body to man." One of the hunters seems to sense his ambivalence: "It's what we have to do," he tells Kizzia softly.

"I asked Mike what they watched for. He said there was a way of seeing where the submerged whale was swimming. When the water was shallow enough you could see its wake on the surface. '*Qavlunaq*,' I said. 'Making eyebrows.' Mike's own eyebrows lifted in surprise, and he started laughing. . . . 'Are you an Eskimo in disguise?' "

The wake of pioneers and entrepreneurs who have swooped down on Alaska has not always been so ephemeral or so benign as that of the whale. Kizzia leaves us, however, a morality tale to ponder. His friend Mike, he says, explained why his people no longer hunt killer whales: "It turned out the hunters weren't at the top of the food chain after all. 'They got revenge,' he said of the whales."

Jonathan Walters
Washington freelance writer

Learning to Look: My Life in Art
John Pope-Hennessy
Doubleday, $27.50

The beginning and ending of John Pope-Hennessy's entirely civilized autobiography are lyrical, elegiac bookends for one of the most energetic, accomplished careers in the century's eventful record of art history and what, in the trade, is called "museology."

He begins: " 'Is that where you want to die?' asked a friend when I told her I was moving to Florence [he is 77]. 'Yes,' I said, 'but I want to live there a bit first.' " He had been going to Florence for extended stays over the previous 40 years, but that was not enough.

He has written extensively on Italian painting, sculpture, drawings: a three-volume introduction to Italian sculpture, which is encyclopedic and structural in the field; the catalog of the Italian sculpture collection of the Victoria and Albert Museum, where he was employed for 30 years, beginning as a curator and ending as the distinguished director. He has written on Fra Angelico, Sienese painting, Sassetta, Luca Della Robbia, Cellini, Raphael and much more—numerous books, scores of articles, hundreds of speeches.

He has been director of the British Museum, has twice said no to offers to head the Metropolitan Museum of Art in New York. Eventually, he accepted with pleasure an appointment as consultative chairman of the latter's department of European paintings, in conjunction with an appointment as professor of art history at New York University's Institute of Fine Arts, one of the world's chief training grounds for art historians.

The greater part of Pope-Hennessy's autobiography is what he says it is, a life in art. For those who are seriously interested in art and the collecting of it, the administration, the scholarship, the factions, the feuds, the governmental bureaucracies; for those who are interested in intimate glimpses and assessments of people on the order of Bernard Berenson, Kenneth Clark, the infamous Anthony Blunt, the book is invaluable.

Pope-Hennessy has many friends in high places—highly distinguished; highly accomplished; oftentimes, as it goes in the world of art, highly rich—everywhere in the world. But he is essentially happy to be alone with himself, somewhat remote, sociable to be sure, but somehow cool. His passion is reserved for things, not people.

"Objects mean more to me than people," he declares flatly, with his usual clinical objectivity. "It is not that I am frigid or reclusive, but that object-based relationships are more constant than human ones (they never change their nature and do not pall)."

In the last paragraph Pope-Hennessy observes: "Nothing has been written on the depiction of the sky in Tuscan art. After rain, it lights up like a tangerine. . . . When the sun sets, the lights come up on the Lungarno and sparkle in reflection . . . you are transported to the tranquil Florence of the nineteenth century. Next morning you throw open the shutters with expectancy, and in pours the caressing, invigorating sun." It is that rare touch which, in what he writes, illuminates works of art, which elevates taste and impeccable scholarship to the level of art itself.

Bennett Schiff
Contributing Editor

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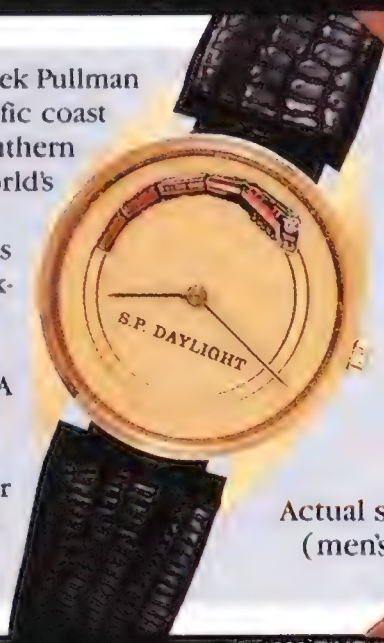

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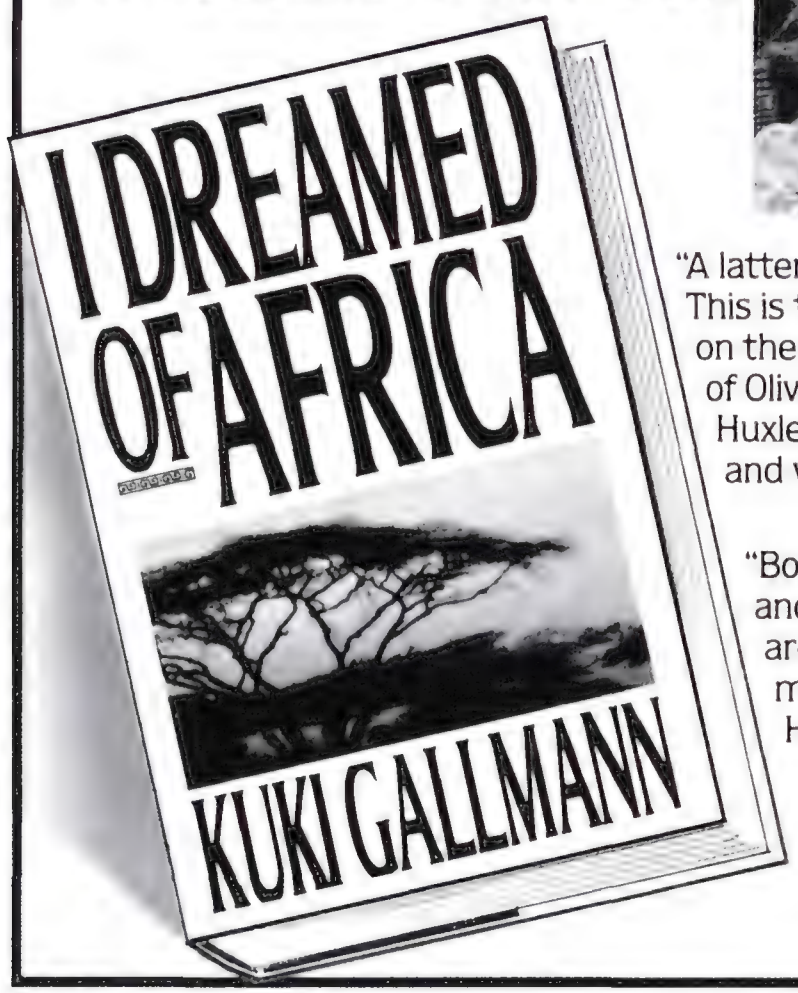

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Last Chance to See
Douglas Adams and Mark Carwardine
Harmony Books, $20

The world's endangered species list is adding new names at an alarming rate; Douglas Adams and Mark Carwardine's book is a timely spotlight on the problem. The message they bring is a sobering reminder that some of our fellow sojourners on this planet, feathered and furred alike, are imperiled indeed.

By turns insouciant and wistful in tone, the book takes the form of a series of journeys that zoologist Carwardine (*The Animal Atlas, The Encyclopedia of World Wildlife*) and comic sci-fi novelist Adams (*The Hitchhiker's Guide to the Galaxy* and *So Long, and Thanks For All the Fish*) undertook for the BBC to search out some of the world's rarest and most threatened species. The first trip took place in 1985 and the last during 1988-89.

The British pair's itinerary reads like a journey to an exotic-land theme park—Madagascar to locate the aye-aye (a type of lemur), Zaire to track down the mountain gorilla and white rhino, New Zealand to seek out the mysterious kakapo, Indonesia to hunt for the famed Komodo dragon, China for its river dolphin and Mauritius for the elusive Rodrigues fruit bat.

Some of the numbers relating to these beleaguered animals are definitely worrisome. For example, the number of kakapo (a fat, foghorn-voiced parrot) in southeastern New Zealand is "forty and falling," despite efforts by dedicated locals to attract and nurture breeding females. And 5,000 Komodo dragons doesn't seem a red-flag number until one learns that only 350 of them are female.

Adams raises a disturbing question when he reflects on the word "endangered." Perhaps, he thinks, we "hear it too often to be able to react to it afresh." Yet even as extinction continues at a savage pace, we don't begin to know how many plants and animals actually exist in the world. "A staggering 1.4 million have been . . . identified so far," Carwardine reports, "but some experts believe that there are another 30 million yet to be discovered." Inevitably, we seem to be facing a world that will be a "poorer, darker, lonelier place"—unless we band together to save Earth's transient beauties and creatures today.

William Dieter
Denver novelist

Additional reading

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Four Neotropical Rainforests, edited by Alwyn H. Gentry, Yale University Press, 1990

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The Inns of Court and Chancery by William John Loftie, Macmillan, 1895

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Newark by John T. Cunningham, New Jersey Historical Society, 1988

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Against the Odds: African-American Artists and the Harmon Foundation by Gary Reynolds and Beryl J. Wright, Newark Museum, 1989

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Two Lives, One Russia by Nicholas Daniloff, Houghton Mifflin, 1988

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Women in Exile: Wives of the Decembrists by Anatole G. Mazour, Diplomatic Press (Tallahassee, Florida), 1975

Nicholas I: Emperor and Autocrat of All the Russias by W. Bruce Lincoln, Allen Lane (London), 1978

Mabel Dodge Luhan (p. 122)

Mabel Dodge Luhan: New Woman, New Worlds by Lois Palken Rudnick, University of New Mexico Press, 1984

Movers and Shakers by Mabel Dodge Luhan, University of New Mexico Press, 1985

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Mabel: A Biography of Mabel Dodge Luhan by Emily Hahn, Houghton Mifflin, 1977

Winter in Taos by Mabel Dodge Luhan, reprinted by Las Palomas de Taos (Taos, New Mexico), 1987

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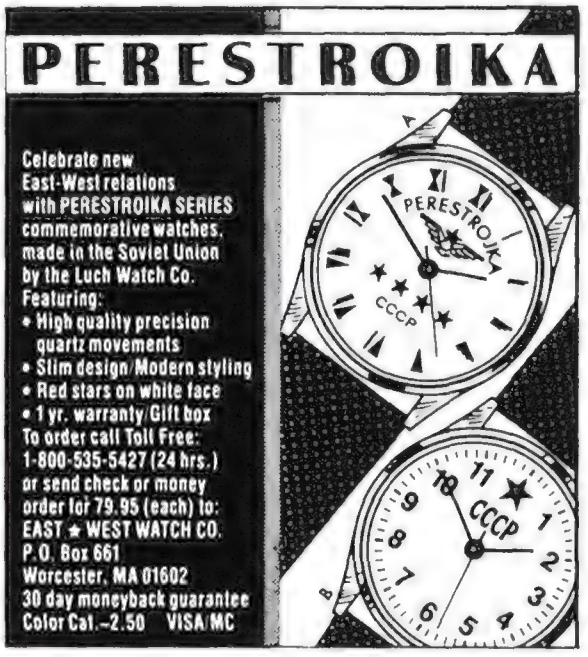
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Smithsonian highlights

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The new VHS video *Guide to the Smithsonian* is an excellent aid for previsit planning. For ordering information and the free Associates' Planning Packet, send a postcard to Associates' Reception Center, Smithsonian, Washington, D.C. 20560, or call (202) 357-2700. For hearing-impaired visitors, use TDD and call (202) 357-1729. Begin your visit at the Smithsonian Information Center, located in the Castle. Hours are 9 A.M. to 5:30 P.M. daily.

Extended summer hours
Starting Monday, June 17, through Labor Day, Monday, September 2, three Smithsonian museums will operate on extended hours daily from 9:30 A.M. to 7:30 P.M.: National Air and Space Museum, National Museum of American History and National Museum of Natural History. Extended hours at the National Zoological Park are from 8 A.M. to 8 P.M. for grounds, April 15 through October 15. The animal buildings are open from 9 A.M to 6 P.M., May 1 through September 15.

Freer remains closed
The Freer Gallery of Art is closed until late 1992.

Special June exhibits and events

Arthur M. Sackler Gallery
Court Arts of Indonesia (through September 2) Some 160 artworks reflect the traditions of the royal courts of Indonesia. See *Highlights continued*, page 144.
Crushed Lapis and Burnished Gold: The Art of Illumination (June 9-December 8) A selection of manuscripts from the Sackler's Vever Collection reveal variety and scope of this art form.

National Museum of Natural History
Beyond the Java Sea: Art of Indonesia's Outer Islands (through July 14) Some 200 works represent a synthesis of the cultural life of Indonesia's peoples. See *Highlights continued*, page 144.
Indonesian Village Worlds (through July 17) A photographic exploration by anthropologist Eric Crystal.

National Museum of American History
Westward to Promontory: Andrew J. Russell's Photographs of the Building of the Transcontinental Railroad, 1868-1869 (through June 30) Series of original prints documents the construction.
Nusantara: Lands and Peoples of Indonesia (through December 31) Rare books dating from the late 16th through 20th centuries.

National Air and Space Museum
Art of the Cosmic Age (through December) Exhibition features 70 paintings, prints and sculptures by contemporary space artists from the Soviet Union, North America and Europe.
Blue Planet (runs indefinitely) New Smithsonian Imax film features spectacular footage of Earth and its environment, as seen from space.

National Museum of American Art
Eadweard Muybridge and Contemporary American Photography (June 28-September 8) Selections from Muybridge's "Animal Locomotion" and "The Attitudes of Animals in Motion" series.
The West as America: Reinterpreting Images of the Frontier, 1820-1920 (through July 7) A critical look at the role of imagery in persuading people to move West.

National Portrait Gallery
Group Portrait: The First American Avant-Garde (through October 27) Art from the circles of Alfred Stieglitz, Marcel Duchamp, Gertrude Stein, Ezra Pound.
Annie Leibovitz Photographs 1970-1990 (through August 11) Exhibit showcases portraits of figures important in American popular culture.

Hirshhorn Museum & Sculpture Garden
Awards in the Visual Arts 10 (June 12-September 2) Show features work of ten U.S. artists who have won Awards in the Visual Arts for 1990—painting, sculpture, multimedia environments.
Directions—Adrian Piper: What It's Like, What It Is #2 (June 19-September 22) Environmental installation raises questions about race and class.

National Museum of African Art
Africa Illustrated: Fantasy and Reality Before 1900 (June 5-November 10) Exhibit of early history, ethnology and travel books on Africa, whose illustrations echoed and shaped European perceptions of the continent.
African Reflections: Art from Northeastern Zaire (through January 12, 1992) The refined and delicate art of the peoples of northeastern Zaire.

Arts and Industries Building Experimental Gallery
Brazil Via New York/Oxygen Share (through July 7) Installation by Brazilian artist Jonas dos Santos comments on the depletion of the Amazonian rain forest.
Casitas: An Urban Cultural Alternative (through June 30) Depicts *casitas*, a Caribbean architectural form.

Anacostia Museum
Kaleidoscope: African American Photography in Washington, D.C. (June 22-September 29) Exhibition of selected views from some 30 area photographers.

Renwick Gallery
Lenore Tawney: A Retrospective (through July 21) Survey of the work of the pioneer fiber-artist.
Glassworks (through September 29) Site-specific installations of works by contemporary glass artists.

Cooper-Hewitt Museum (New York)
The Cooper-Hewitt Collections: A Design Resource (through August 30, 1992) Some 1,200 objects chronicle the history and collecting philosophy of one of the important repositories of design.

Exhibition catalogs

Catalogs available currently include:
Beyond the Java Sea: Art of Indonesia's Outer Islands (paper, $29.95)
Annie Leibovitz: Photographs 1970-1990 (paper, $7.50)
Awards in the Visual Arts 10 (paper, $20)
The West as America (paper, $35; cloth, $60)
To order, send check or money order to Museum Shops, 3301 75th Avenue, Landover, Maryland 20785. Include 15 percent of total purchase to cover postage and handling (minimum, $1.75).

Smithsonian on the air

Smithsonian Presents Invention: A series of half-hour television programs explores the spirit of innovation behind invention. The series airs on the Discovery Channel Tuesdays at 9:30 P.M., EST. Check local cable listings.
Folk Masters: A series of one-hour radio programs featuring award-winning performers of traditional music in the Americas. Series airs on 140 public radio stations nationwide. Check local listings.
Smithsonian World: "The Doors of Perception," an exploration of human consciousness, will air June 5 at 8 P.M., EST. Check local PBS listings.

Smithsonian National Associates

Cranbrook Educational Community, located in Bloomfield Hills, Michigan, will host a two-day program June 21-22. Topics include the solar system, tropical rain forests and contemporary art.

For further information, write or call U.S. and International Events Program, 490 L'Enfant Plaza, S.W., Suite 4210, Washington, D.C. 20560; (202) 287-3210.

Resident Associate Program

To become a Resident Associate, or for fee and ticket information, call 357-3030. Here are some June events:
Banned and Blacklisted in Czechoslovakia (June 6, 13, 20, 27; 8 P.M.) Films banned in Czechoslovakia in late 1960s.
Don Pullen's Afro-Brazilian Connection (June 7; 7:30 P.M.) Famed jazz pianist blends old traditions and new directions.
Beyond Brewster Place: An Evening with Gloria Naylor (June 15; 6:30 P.M.) Noted author reads from her latest work in progress, *Bailey's Cage.*

Smithsonian Institution Traveling Exhibition Service

SITES organizes and circulates exhibitions to cities throughout the United States and abroad. To sponsor a show in your community, write SITES, Smithsonian, Washington, D.C. 20560. Here are some June exhibits:
• Chico, California (June 7-July 21) *Family Folklore*, Chico Museum.
• Rockford, Illinois (June 22-July 28) *Constance Stuart Larrabee: WWII Photo Journal*, Rockford Museum Center.
• Virginia Beach, Virginia (June 22-September 8) *Sea Stars*, Virginia Marine Science Museum.

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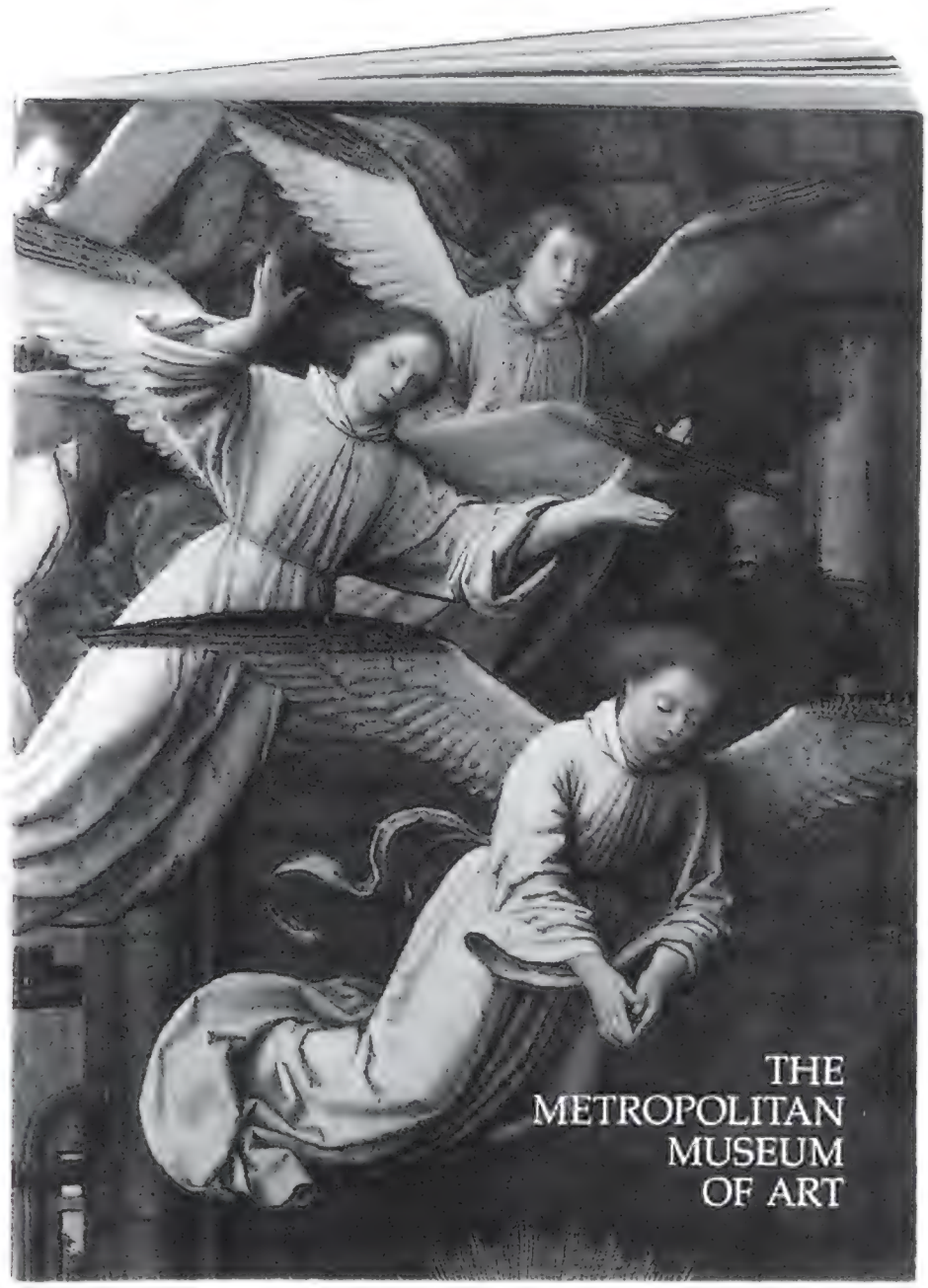

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Highlights continued

The beguiling arts of Indonesia

The art and culture of Indonesia is being celebrated at the Smithsonian in two compelling exhibitions that are part of the nationwide Festival of Indonesia. A tropical archipelago composed of more than 13,000 islands, Indonesia is home to 178 million people representing 300 distinct linguistic-ethnic groups.

Court Arts of Indonesia (on view at the Arthur M. Sackler Gallery through September 2) reveals the artistic splendor of the royal courts, specifically those that once ruled on the islands of Java, Bali and Sumatra. Organized by the Asia Society in association with the Sackler, the show features works from the 8th century to the 20th. Ceremonial weapons, bejeweled court regalia, intricate textiles, dance masks and puppets reflect the complex of courtly myth and ritual.

Beyond the Java Sea: Art of Indonesia's Outer Islands (on view at the National Museum of Natural History through July 14) reaches past the "inner islands" of Java and Bali to explore the traditional art of Indonesia's outer islands. There, art fulfills powerful social and religious functions, linking village life with the supernatural; honoring ancestors; affirming social rank, political power and kin relationships. Most of the show's 210 objects—from betel-nut containers to elaborate prow ornaments—date from the 1800s or early 1900s.

Performing arts events, lectures and films enliven both exhibitions. It's a short distance to travel to visit such a far-flung and intriguing culture.

Diane M. Bolz

Jewel-encrusted kris, or mystic dagger, from East Sumatra is symbol of power.

Wooden puppet, East Java, represents queen of ancient kingdom of Majapahit.

Ramayana's demon king Rahwana takes form in Javanese shadow puppet.

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Value is the byword of the Smithsonian's low-cost Odyssey Tours. Destinations include: Great Britain, Italy, France, Canada, Mexico and the United States. For an Odyssey brochure, call 1-800-524-4125. For other study tours and seminars, see the address and phone number below.

Domestic Study Tours

Smithsonian "Anytime" Weekend
New low prices from $99 per person for a two-night package.

Aspen (Colorado) *July 9-14* Art galleries, private collections, music.

Oregon *July 14-21* Natural, cultural history.

Salmon River (Idaho) *July 18-26*

Colorado for Families *July 20-26*

NEW Rogue River (Oregon) *July 23-29*

Abbotsford Air Show *August 7-11* Seattle, Vancouver. Includes Boeing tour.

Nez Perce *August 10-18* Trail ride in Idaho.

Delta Queen *August 11-19* Upper Mississippi from Minneapolis to St. Louis.

Baseball Stadiums *August 15-21* Chicago, Detroit and Cleveland.

Lewis and Clark *August 18-25* Horseback camping on the 1805 trail in Idaho.

Arches and Canyonlands (Utah) *August 31-September 7*

Washington State *August 31-September 9* Olympic and Mount Rainier Parks.

Arizona Wildlife *September 4-12* Sonoran Desert and Chiricahua Mountains.

Maine Seascapes *September 7-14*

Sojourn in Sedona (Arizona) *September 12-18*

Atlantic Quest Cruise *September 13-30* Canada's Atlantic Provinces.

California's Channel Islands *September 15-20*

New York: Ellis Island *September 19-22*

In the Footsteps of Coronado (New Mexico) *September 21-27*

Columbia River Cruise *September 21-29*

Air and Space Museum: Behind the Scenes *September 22-25* For Contributing Members.

Grand Canyon Weekend *September 25-29*

Bryce, Zion and the North Rim *October 2-12*

North Carolina Historic Homes *October 6-13*

Texas Wildlife Safari *October 16-20*

Detroit Auto Barons *October 31-November 3*

Civil War: Eastern Theater *October 31-November 10* Visit Antietam, Gettysburg.

Foreign Study Tours

Countryside Tours *July-September* Relaxing sojourns in Europe.

British Isles Cruise *June 23-July 9* Aboard the *Argonaut*.

Northern Landscapes—Impressionists in Paris and Normandy *June 24-July 3*

Hikes in Austria and Italy *June 25-July 9*

Scotland by Train *July 13-24*

Beyond the North Cape *July 22-August 8* Bergen-to-Spitsbergen cruise.

Kenya *August 1-17* Tent safari.

NEW Summer Island Pageant Cruise *August 5-21* Madeira, Corsica, the Canaries and Balearics.

USSR-Far East *August 7-20*

Tibet *August 18-September 6*

Switzerland by Train *August 22-September 3*

NEW Viking Cruise *August 29-September 16* Copenhagen-New York, *Seabourn Spirit*.

Russia's Golden Ring *September 1-15* Moscow, Leningrad, Pskov, Suzdal.

Medieval Jewels of the Midi (France) *September 2-14*

Hungary *September 5-19*

Classic China *September 5-25* Beijing, Xi'an, Guilin and more.

Indonesia *September 5-26*

NEW Battlefields of Europe *September 7-20* France, Belgium—from Napoleon to WWII.

Czechoslovakia *September 8-21*

Danube Cruise *September 9-26*

NEW Man and His Environment Cruise *September 10-23* From Bruges to Barcelona on the *Illiria*.

Himalayan Kingdoms *September 11-30* Bhutan, Ladakh and Nepal.

United Germany *September 12-26*

Southern Italy and Sicily *September 14-29*

Ireland Walks *September 15-26*

NEW Where Mozart Made Music *September 18-29* Vienna, Salzburg, Prague.

Australia-New Zealand *September 27-October 17*

USSR *October 9-19* Moscow, Leningrad, Tallinn.

NEW Autumn in Wessex (England) *October 15-27*

Japan Journey *October 19-31*

Folk Art of Colonial Mexico *October 27-November 8*

South India *October 27-November 16*

Thailand and Laos *November 6-22*

Mexico's Copper Canyon *November 30-December 7* Train journey.

Smithsonian Seminars

Join top scholars for classroom study and tours. Courses are held in Washington, D.C. unless otherwise indicated.

Kenya *July 1-18*

Hawaii's Active Volcanoes *August 4-8 or August 11-15* Hilo, Hawaii.

Oxford (England) *September 14-27*

Write to Smithsonian National Associate Program, Washington, DC 20560 or call (202) 357-4700 for tour and seminar brochures.

SMITHSONIAN-STYLE

Chesapeake Ecology *September 16-20*
Annapolis, Maryland.

Creative Writing *September 16-20*
Annapolis, Maryland.

NEW Riviera Art (France) *September 17-27*

NEW Decorative Arts *September 19-22* At the Cooper-Hewitt Museum, New York.

Aircraft Restoration *September 23-26*

NEW The Atomic Age *October 1-5*
Los Alamos, New Mexico.

NEW Yellowstone Ecology *October 6-12*

NEW American Quilts *October 7-10*

Rome Seminar *October 9-21*

NEW Middle East Update *October 21-24*

Southwestern Art and Archaeology *October 27-31* Santa Fe, New Mexico.

Research Expeditions

Contribute your talent and financial resources to Smithsonian research. Work with curators at museums or in the field.

NEW Washington, D.C. *June 30-July 13*
Inventory native-American collections.

Front Royal, Virginia *July 6-14* Study wildlife and vegetation in the Shenandoah Valley.

Costa Rica *July 6-18 or September 29-October 11* Study volcanoes and plants.

NEW Fort Ross, California *July 7-14*
Excavate a Russian fur-trade settlement.

Pierce, Idaho *July 14-24* Interview loggers.

Washington, D.C. *July 21-27 or October 27-November 2* Work on a videodisk project.

Washington, D.C. *July 21-August 3* Archive aviation and aerospace documents.

Crow Agency, Montana *August 14-20*
Document the annual Crow Fair.

NEW Jamaica *August 15-27* Record the East Indian festival Hosay.

Orofino, Idaho *September 17-27* Document Lumberjack Days.

(202) 287-3210 for expedition brochures.

A CREW WITH A VIEW

They're The McLaughlin Group. Each with a view that's contentious and contagious. (Clockwise from left) Jack Germond, Eleanor Clift, John McLaughlin, Fred Barnes, Morton Kondracke, and Pat Buchanan.

Made possible by a grant from GE.

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If you've ever had occasion to write with one of the famous European pens, you know what marvelous products they are. Writing with them is a joy. It is almost effortless. The pen appears to float across the paper—even your thoughts seem to flow more freely. The substantial drawback, however, as with so many other nice things, is that the price of these luxury pens is awfully high. It's easy to spend $150 or more on one of them. Our Japanese friends have created their own version of these luxury pens. They are equally pleasing and quite similar in appearance, heft and feel. They have the same hi-lacquer finish, the same fine gold-tone accents and the same gold-plated clip as the famous European luxury pens. The exclusive ceramic writing tip provides silk-smooth, effortless writing. It will never flatten, stall or skip, even after hardest and longest use.

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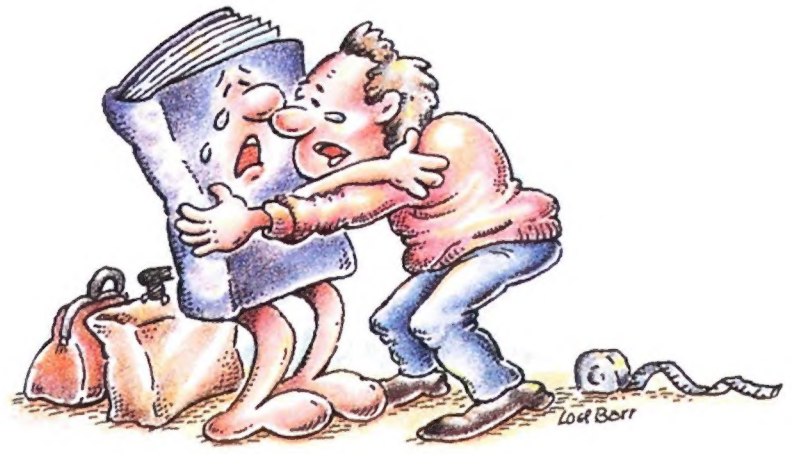
By Michael Kernan

If only we'd collected condensed books . . .



We are moving. We have books, and we are moving.

The house we are leaving has bookcases in all five bedrooms and a built-in bookcase that covers an entire wall of the living room.

We are moving to an apartment. It is a large apartment. But it is an apartment.

Now, this built-in bookcase of ours is crammed and stuffed with books—has been for years. Books lined up two deep. Books sandwiched on top of the others. Tall books stuck in headfirst. Books that conceal behind them items long lost, like my father's comic diary from 1902, which I was sure had disappeared in my college days.

Several weeks ago we started pruning. My paperback thrillers. That was easy. I am hard to thrill these days. Her old film catalogs and journals from a university where she no longer teaches. My college textbooks, saved these 40 years. For what? Did I think I might be tested on them? Her Camus. My Ford Madox Ford. Her Rousseau. My *Companion Guide to Jugoslavia*, so dated even the country's name is misspelled. (Its photographs are dated, too, like my memories. Ah, there is an old shot of the island of Korcula. We rented rooms overlooking the ancient, honey-colored walled city and its harbor for $1.50 including breakfast and laundry. And there in the background is the mountain I climbed in my city shoes. Gone, gone, into the big plastic bag.)

Never look into books you are throwing away.

We took 19 large plastic bags of books to the Goodwill. I had to put down the backseats in the station wagon. Great gaps in the bookshelves. We were feeling proud and Spartan.

Then I took out my tape measure. Subtracting the holes left in the bookcases that will go with us from the books left in the built-in, I came up with the number 51. That is, 51 feet of books still to be got rid of if we didn't want 26 boxes (assuming 2 feet of books per box) stacked waist-high across the apartment's wall-to-wall carpet.

So. Back to the shelves. Stoics.

"All right," I said. "This is it." And without another word I gave up my *Oxford English Dictionary*. When I piled the giant blue-jacketed volumes on the floor they reached to my chin. I drove them to the church, which was having a benefit auction. Leaving them was like leaving our golden retriever behind when we moved from California.

At least the books didn't put their paws on my shoulders and give me that look: "Do I really have to stay in this strange man's garage?" (Not to worry about Doctor Dog. He went to a big country place in Oregon, where for all I know he is still chasing birds, squirrels, moles, cats, dogs of all sizes and an occasional horse. Doctor Dog can take care of himself.)

Desperate, I unloaded all the antique books I had inherited, bound in leather and gold leaf, on our book-collector son: six volumes of Addison, the 11 Beaumont and Fletchers, the 21 small-print volumes of Washington Irving (and I thought all he had written was "Rip Van Winkle" and the story of the headless horseman), the 25 books of Thackeray, the Pepys and the Chaucer, Clarendon's *History of the Rebellion*, Mrs. Behn's plays and two or three sets of Shakespeare in 2-point type.

Next a strange thing happened. In clearing the basement of its 30 or so boxes of stuff accumulated over 23 years, I had blithely thrown out the manuscripts of my six unpublished novels. Gone forever in a trash bag. So, as I ran an eye past the rows of surviving books, I began to mutter, "Hey. We're throwing out *me*—and saving *him*?"

Say no more. Pow! There goes Hemingway. Biff! You too, Steinbeck. Smak! And Faulkner—oh no, not Faulkner, not yet, not yet. Maybe the stories. That's a fat one. But "The Bear" is in that volume, and you can't find "The Bear" anywhere these days.

Nothing about getting rid of books is easy. Last week we noticed that I had given away a certain paperback copy of Hardy's *Far From the Madding Crowd*. We had bought it the time we were marooned in Venice for a month and ran out of reading material and only by luck found the English bookstore there, the one with the huge white dog lying in the doorway. This particular book meant Venice to us, with its elegant Italian bookmark and all. Besides, it got me rereading Hardy.

Off to Goodwill Industries across town in the rain. A frantic search of its shelves. No luck. I checked some more and realized that our stuff hadn't been set out yet. Hardy's there, though. I'll find it.

We have given up new books, out-of-print books, signed books, a ten-inch-thick *Webster's*, and a weird supermodern encyclopedia of sugarcoated information that has more pictures than words and doesn't bother with alphabetical order. (This is the only book I have really enjoyed giving away. More than once I would have thrown it across the room, except that it is too heavy.)

Latest report: we are down to 24 feet.

We are almost free.

Today I somehow found myself in a bookstore. There was this book, *The Origins of English Words* by Joseph T. Shipley. Great book. Did I buy it? Are you kidding?

Come on, it's only two inches wide . . .

Small. Very small.

Actual Size.

Introducing the Magnavox EasyCam 8. It may weigh under two pounds, but don't mistake it for a lightweight. This compact camcorder has all the features you need to capture life's biggest—and smallest—moments.

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DEWAR'S PROFILE:

MARK SALZMAN

HOME: Los Angeles, California.

AGE: 29.

PROFESSION: Author, actor, martial artist. "I know everyone in L.A. says that, but really, I am."

HOBBY: Going to the zoo. "It's the one place I won't be asked about China–except by, maybe, the pandas."

LAST BOOK READ: *Discos and Democracy: China in the Throes of Reform*, Orville Schell.

LATEST ACCOMPLISHMENT: Writing the script and starring in the movie "Iron and Silk," based on his book about his experiences as an English teacher in China.

WHY I DO WHAT I DO: "What else do you do with a degree from Yale in Chinese Language and Literature?"

QUOTE: 之呼者也

PROFILE: Animated, ebullient and prone to colorful exaggeration.

HIS SCOTCH: Dewar's® "White Label®, straight up. "After years of drinking nothing but rice wine, it was a pleasure to return to a place where my Scotch was always on the menu."

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